

# SCIENCE

## Mafin Book

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Second Term

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Protecting Comment Our Planet





## Energy and Fuel

#### Unit Concepts:

Concept

Devices and Energy

Concept (

About Fuel

Concept 3

Renewable Energy Resources

Unit Project: Dam Impacts

#### Unit Objectives

#### In this unit, we will study:

- 1 Energy and devices around us.
- 2 Types of fuel.
- Renewable and nonrenewable sources.
- 4 How electricity is being generated in electric power station.
- 5 Using wind energy to generate electricity.
- 6 Using water of river to generate electricity.
- 7 How can we conserve energy?

## Get Started What I Already Know

>>> Humans use many forms of fuel in their daily lives, such as:







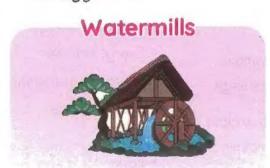


Fuel is burned in electric power stations to generate electricity that is used in lighting houses and operating devices.

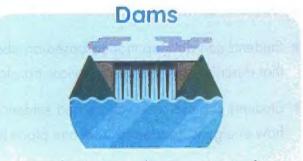


#### **Water for Energy**

The moving water has kinetic energy, that can be used to produce energy.



 In the past, people have used moving water to turn the wheels of watermills to create energy to move machines.



- In modern time, dams are used to increase the kinetic energy of water.
- Fast-moving water is used to turn large turbines to generate electricity.



#### **Devices and Energy**

#### **Concept Objectives:**

#### By the end of this concept:

- Students can develop models based on observations that describe how everyday devices transform energy.
- Students can use observations and evidence to explain how energy is transferred from one place to another.

#### Key Vocabulary:

- Chemical energy
- Energy transfer
- Energy conservation
- Energy source
- Sun
- Earth

# Concept 1

### **Devices and Energy**

	Spenter Spenter
Commission	Lesson 1
Activity 1	Can You Explain?
Activity 2	Energy in Remote-Controlled Cars
Activity 3	Mars Rover
6.7915.00	Lesson 2
Activity 4	What Do You Already Know About Devices and Energy?
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April 10 mary 1	Lesson 3
Activity 6	Energy and Everyday Devices
Activity 7	The Conversation of Energy
	A second
Contract Contract	Lesson 4
Activity 8	Follow the Flow
Activity 9	Build an Energy Chain
Activity 10	Record Evidence Like a Scientist Energy in Remote-Controlled Cars



#### >> We have learned that,

- Energy can be changed from one form to another.
- · Most devices in our houses need electricity.

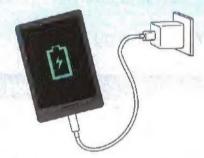


Technology can help us turn light energy from the Sun into different forms of energy.

• تساعدنا التكنولوجيا على تحويل الطاقة الضوئية من الشمس إلى صُور مختلفة من الطاقة.

 Solar cells can convert solar energy into electrical energy to operate many devices, such as calculators and mobile phones.





تقوم الخلايا الشمسية بتحويل الطاقة الشمسية إلى طاقة كهربية؛ لتشغيل العديد من الأجهزة مثل: الآلات الحاسبة والتليفونات المحمولة.

### Check your understanding?

- >>> Put ( / ) or ( / ):
  - 1) Most of the energy we use every day comes from the Sun.(
  - 2 Solar energy is a clean source of energy. (
  - 3 Solar-powered calculators use electricity. ( )



#### Activity 2 Energy in Remote-Controlled Cars

#### >> Choose the correct answer:

- Toy cars are controlled \_\_\_\_\_ from a distance. (manually remotely)
- Batteries are used to operate \_\_\_\_\_. (electric devices some tous)

#### Many toys may be operated remotely, such as: Trucks **Boats Planes**

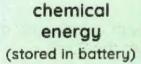
All of these toys need energy and use electricity to move and do tasks, such as turning corners, moving their arms, or operating cameras.

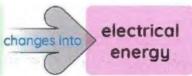
- تعمل العديد من الألعاب بالتحكم عن بُغد مثل: السيارات والشاحنات والطائرات والراكب.
- كل هذه الألعاب تحتاج إلى طاقة وتُستخدم الكهرباء للتحرُّك والقيام بمهام مثل: الانعطاف وتحريك الأذرع أو تشغيل الكاميرات.

#### How do these toys get energy



- Toys need a source of energy to operate, such as batteries.
- Batteries store chemical energy inside them.
- When toys are operated;







kinetic energy sound energu

- تحتاج الألماب إلى مصدر للطاقة مثل البطاريات لتعمل.
  - تخزن البطاريات طاقة كيميائية بداخلها.
- عندما يتم تشغيل اللعبة، تتحوَّل الطاقة الكيميائية إلى طاقة كهربائية، والتي يتم تحويلها إلى طاقة حركية أو صوتية.

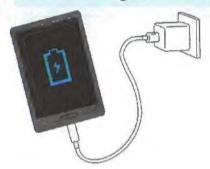
What can we do when the batteries of toys run out



#### Batteries can be



 By plugging the device into the nearest charger.



#### 2 Replaced

· With new ones from a store.



عند نفاد شحن البطاريات بمكننا:

2 استبدالها عن طريق شراء بطاريات جديدة من أحد المتاجر.

🔝 شحنها عن طريق توصيلها بأقرب مَقْبس،

### Check your understanding?

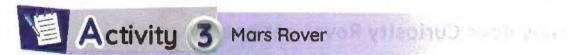
Fill these gaps with the correct words:

(electrical - kinetic - sound - chemical - replace - recharge - Energy)

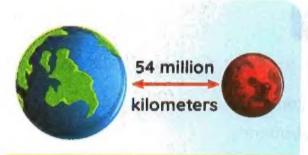
- 1 can be changed from one form to another.
- 2 When a toy car is operated, \_\_\_\_\_ energy inside the battery changes into \_\_\_\_ energy, then into \_\_\_\_ energy or \_\_\_\_ energy.
- 3 If the battery runs out, we have to \_\_\_\_\_ it with a new one or \_\_\_\_ it into a nearby charger.



Discuss with your students the importance of batteries in operating some devices.



- >> The distance between Earth and Mars is about 54 million kilometers.
- >> A spacecraft takes six months or more to reach Mars.
- In the past few years, humans have sent many missions to Mars using robots and vehicles operated remotely and none of these missions included people.







**Curiosity Rover** 

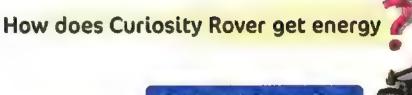
- >> One of the most famous robots on Mars is the Curiosity Rover.
- >> Like remote-controlled toys, these rovers need energy.



The batteries used in the toys cannot be used in these robots.

Because robots on Mars are too far from local stores or sockets (plugs) on Earth.

- المسافة بين الأرض والمريخ تبلغ حوالي ٤٥ مليون كيلومتر.
- تستفرق المركبة الفضائية حوالي سنة أشهر أو أكثر لتصل إلى كوكب المريخ.
- في الماضي، أرسل البشر العديد من البعثات إلى المريخ بواسطة الروبوتات والمركبات التي يتم تشغيلها عن بُعْد، ولم تضم تلك البعثات أشخاصًا.
  - . من أشهر تلك الروبوتات Curiosity Rover.
  - كالألعاب التي تعمل بالتحكم عن بُعْد، تحتاج تلك الروبوتات إلى مصدر للطاقة.





Solar Energu

Long-lasting Batteries



#### Language of a boundaries

How does the Curiosity Rover move and explore Mars



- Solar panels on the rover convert solar energy into electrical energy to charge the rover's batteries.
- >> Electrical energy from the batteries powers the rover's sensors, and electrical energy is converted into thermal and kinetic energies as the rover moves and explores Mars.
  - تعمل الألواح الشمسية الموجودة في العربة على تحويل الطاقة الشمسية إلى طاقة كهربائية تُستخدم لشحن بطاريات العربة.
  - تقوم الطاقة الكهربائية في البطارية بتشغيل المستشعرات، وتتحوَّل الطاقة الكهربية إلى طاقة حرارية وحركية تُمكّن العربة من المركة واكتشاف للربخ

#### Check your understanding?

- >>> Put ( </ ) or ( </ ):
  - Operating remotely means being controlled from a distance.
  - It is easy to replace the batteries of the Curiosity Rover. )
  - Some of the exploration missions to Mars contain humans. (
  - Curiosity Rover is used to explore the moon. (

# Exercises on Lesson 1

🦚 Energy can be	from one	form to anothe	er.
a. changed	<ul><li>b. destroyed</li></ul>	c. created	<b>d.</b> b and c
Most toys deper	end onas	a source of ene	ergy.
a. water	<b>b.</b> batteries	c. fuel	d. food
toys ca	n be operated rer	notely from a c	listance.
a. Car	b. Plane	c. Boat	d. All the previous
Batteries store	energy in:	side them.	
a. chemical	b. electrical	c. solar	d. kinetic
Batteries can b	e by elect	ricity.	
a. changed	b. charged	c. replaced	d. converted
ln a battery of	a toy car,ene	ergy is changed	l Into electrical energy
a. thermal	b. chemical	c. sound	d. light
Curiosity Rover	is designed to ex	plore	
a. the Sun	b. the moon	c. Mars	<b>d.</b> Earth
The distance be	etween Earth and	Mars is about	million km.
<b>a.</b> 45	<b>b.</b> 55	<b>c.</b> 54	<b>d.</b> 540
We can conver	t the solar energ	y intoe	energy inside the solar
panels.			
a. kinetic	<b>b.</b> thermal	<b>c.</b> electrical	d. sound
-	llowing is conside	red energy?	
a. Air	<b>b.</b> Fuel	c. Water	d. Electricity
Both toy cars a	nd Curiosity Rove	r	
a. use solar en	ergy	<b>b.</b> explore Ma	rs
c. are controlle	d remotely	d. use the sar	ne batteries
Put (√) or (X):			
Energy can't be	transformed from	n one form to c	nother ( )

	Energy and Fuel				
(	3 When a toy is operate	d, chemical energy is produced.	(	)	
	(a) If the battery of your r	If the battery of your mobile runs out, you must replace it. (			
THE STATE OF	Mars Rover and toy co	ars can be operated from a distance.	(	)	
山	6 Mars is located a few	kilometers away from Earth.	(	)	
	All missions sent to ex	plore Mars in the last decade included p	people	i re	
			(	)	
	It takes several days f	or a spacecraft to reach Mars.	(	)	
4	Write the scientific	term:			
	1 A robotic vehicle that	is used to explore the surface of Mars.			
		( ************************************	mer ved diriver b - bib edit 4944	)	
<u>a</u>	1 🏖 The form of energy th	at is stored in the battery.	Angenti to to messes to	)	
4	3 A tool on Mars rover t	hat enables it to get energy. (	444 <del>440</del> 4040000000000000000000000000000	)	
	The source of energy	used to operate Curiosity Rover. (	. 20000 0 0	)	
4	Complete the follow	ing using the words between the b	racke	ts:	
		trical – replace – recharge – chemical -			
	A battery stores	energy inside it, while It produces	_ ener	gy.	
	To keep playing with	your toy car, you must it with a i	new or	ne.	
	Electrical energy from	the batteries powers the Mars Rover's	tamaser or	50 I	
	When a toy car is op	erated, electrical energy is changed in	to		
	energy or ene	rgy.			
6	Choose from colum	nn (A) what suits it in column (B):			
	A				
	Column (A)	Column (B)			
	Curiosity Rover	a. can't be changed from one form to a	nother		
1	2 Remotely-controlled	b. can be converted into another form.			
	toy cars				
	3 Energy	c. depends on solar panels to get neede	d ener	gy.	
		d. depend on small batteries to get thei	r enerç	gy.	
	(2 ·	.3			



Column (A)	Column (B)
Solar energy	a. it is the source of energy for Curiosity Rover.
2 Chemical energy	b. it is produced when the toy car is operated.
(a) Kinetic energy	c. it is stored inside a battery.
	(8)







#### Study the following figures, then complete the following questions:



- The batteries of figure (\_\_\_\_\_) are too far from any plugs or stores.
- The batteries of figure ( \_\_\_\_\_) can be recharged from wall socket.
- The batteries of figure (\_\_\_\_\_) can be replaced by new batteries.
- Figures ( \_\_\_\_) and (\_\_\_\_\_) can be controlled from a distance.

#### Give reasons for:

- Toy cars need a source of energy.
- Mars Curiosity Rover needs a source of energy.
- The batteries used to operate toys can't be used in operating the Mars Rover.

#### What happens if?

- The battery of a drone is exhausted?
- Mars Rover's batteries were not recharged?

## Lesson 2

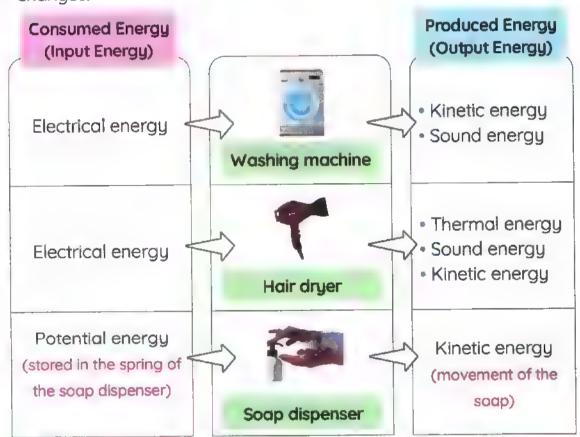


#### Activity



What Do You Already Know About Devices and Energy?

>> Let's think about how different devices get energy and how the energy changes.



it is the energy consumed in the device.

Output energy:

it is the energy

produced from the device.

### Che

#### Check your understanding?

- >>> Put ( \( \sigma \)) or ( \( X \):
  - Nound energy is consumed in radio.
  - 2 Electrical energy is the output energy of solar panels.



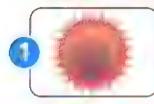
#### A ctivity 5 Energy Chains

- >> The Sun is considered the main source of energy for all devices we use.
- >> Energy chains show the path of energy from the Sun to different devices.

« تُعتبر الشمس هي المصدر الرئيس للطاقة لجميع الأجهزة التي تستخدمها.

· تساعدنا سلاسل الطاقة على معرفة مسار الطاقة من الشمس وصولًا للأجهزة المختلفة.

#### Energy chain when eating food, such as an orange



>> The Sun produces energy that reaches the Earth in the form of light and heat.





>> The green plant converts the light energy of the Sun into chemical energy stored in the form of sugars inside the orange tree.





>> When you eat an orange, your body stores chemical energy and converts it into kinetic energy when you move.

- 📊 تُصدر الشمس طاقة تصل إلى الأرض في صورة ضوء وحرارة،
- 🔁 يُحوِّل النبات الطاقة الضوئية من الشمس إلى طاقة كيميائية مختزنة في صورة مواد سكرية.
- [3] عند تناول البرتقالة يقوم جسمك بتخزين الطاقة الكيميائية ويُحوُّلها لطاقة حركية عندما نتحرك.

Light energy (from the Sun)



chemical energy (stored inside the plant) then inside your body)

is converted into

kinetic energy to do different activities

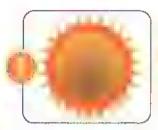


During running, there is a change of energy inside your body. Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.





#### Energy chain when heating a pot of water over a fire



Light energy that comes from the Sun causes the growth of trees.





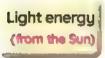
This plant converts the light energy of the Sun into chemical energy which is stored inside the tree in the form of sugars.





When the wood of the trees is burned, thermal energy is released, which heats the water inside the pot.

- 🕥 تعمل الطاقة الضوئية الصادرة من الشمس على نمو الأشجار.
- [2] يُحوِّل النبات الطاقة الضوئية من الشمس إلى طاقة كيميائية مختزنة في صورة مواد سكرية.
  - (ق) عند حرق قِطْع من أخشاب الأشجار تُنتَج طاقة حرارية تُستخدم لتسخين الماء في الإناء.



is converted

chemical energy (stored inside the tree) is converted into

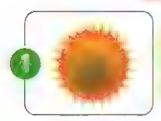
thermal energy (when burning the wood of trees to heat water inside the pot)



There is a change in energy when burning wood. Because the chemical energy stored inside the wood of trees is converted into thermal energy.



#### Energy chain in a hair dryer



>>> Light energythat comes from the Sun causes the growth of trees.



- >>>Coal is produced from the remains of dead trees that died millions of years ago.
- >>> Coal is a source of energy that stores chemical energy



In the electric power station:

- >> Coal is burned to produce thermal energy
- >>> Thermal energy is converted into kinetic energy
- A certain device changes kinetic energy into electrical energy



>> The electrical energy reaches the hair dryer through an electric cord (wire) made of copper.



- >>> When the hair dryer is operated, electrical energychanges into:
  - •Thermal energy. •Kinetic energy. •Sound energy.
    - 🚺 تعمل الطاقة الضوئية الصادرة من الشمس على نمو الأشجار.
- 🙎 يتكوَّن الفحم من بقابا الأشجار المبتة من ملايي السنين. يُعتبر الفحم من مصادر الطاقة التي تخترن بداخلها الطاقة الكيميائية.
  - 🛐 في محطة توليد الكهرباء:

يتم حرق القصم وتتولد طاقة حرارية.

تتحوُّل الطاقة الحرارية لطاقة حركية.

يقوم جهاز معين بتحويل الطاقة الحركية إلى طاقة كهربية.

- 📳 تصل الطاقة الكهربية إلى مجفف الشعر عبر أسلاك تُصنع من التُحاس،
- قند تشغيل مجفف الشعر تتحول الطاقة الكهربية إلى طاقة حرارية، كما تتولُّد طاقة صوتية وطاقة حرارية.



#### Energy and Fuel

#### The following diagram shows the energy path from the Sun to the hair dryer.

Light energy (from the Sun)

is converted into

chemical energy (stored inside coal)

is converted into thermal energy

(when burning the coal inside a power plant)



into

- \* Thermal energy \* Sound energy
- Kinetic energy

(in the hair druer)

is converted

into

electrical energy

(goes through the electric wires)

Energy Chain:

It is a way to describe the energy flow that occurs when we use different devices.

سلاسل الطاقة:هي طريقة تُرضُّح كيفية انتقال الطاقة عند استخدام الأجهزة للختلفة.



- Not all the energy in the energy chain reaches the device
- At each link in the energy chain, some of the energy escapes as other forms that the device does not use.
- · Most of the lost energy leaks out in the form ofheat.

الا تصل كل الطاقة التي دخلت سلسلة الطاقة إلى الجهاز كما نريد.

• في كل حلقة في سلسلة الطاقة، تتسرَّب بعص الطاقة في هيئة صُوِّر أخرى لا يستخدمها الجهار،

معظم الطاقة المفقودة تتسرَّب على شكل حرارة،



#### Check your understanding?

- Put (/ ) or (X ):
  - Green plants store chemical energy in the form of sugar.
  - Coal is used in electric power stations to generate electricity. ( )
  - 3 Electrical energy can flow through wires made of wood.

# Exercises on Lesson 2

(		Choose the co	orrect answer				
	Į.	The input energ	y is the energy .	device	es.		
		a.destroyed in	b.consumed by	y c.produced	from d.resulted	fron	า
	2	is conside	red the main so	urce of energ	y on the Earth's surf	face	<b>:</b> .
		a.Fuel	b.The moon	c.The Sun	d.A battery		
	3	We can use	to produce	thermal energ	gy in power station	S.	
		a.the moon	b.glass	c.the Sun	d.coal		
	4	Some energy is	lost in most dev	rices in the for	m ofenerg	ıy.	
		a.electrical	b.thermal	c.sound	d.kinetic		
	5	Electric wires are	e made up of	materia	l.		
		a.plastic	b.wood	<b>c.</b> iron	d.copper		
	6	The input energ	y in Curiosity Ro	over is	energy.		
		a.thermal	b.solar	c.electrical	d.kinetic		
	7	Which form of e	nergy is not use	ed or produce	d in a hair dryer?		
		a.Sound energy	j	b.Thermal	energy		
		c.Light energy		d.Electrical	energy		
	8	energy is	s consumed wh	ile burning wo	ood.		
		a.Thermal	b.Chemical	c.Kinetic	d.Light		
	9	All of these ener	gies are produc	ed from the h	airdryer, except the	,	Brain white
		energy.					
		a.sound	b.thermal	c.kinetic	d.electrical		
	10	All of the following	ng store chemic	al energy, exc	cept		
		a.a battery		b.an apple			
		c.a compressed	d spring	d.coal			
6		Put (√) or (X):					
	1	Most energy cho	ains start with th	ne moon.		(	)
	2	The energy chai	n of a burning o	candle is com	posed of chemical		
		energy converte	ed into thermal e	energy and lig	ght energy.	(	)
,					_	_	

	- Energy and Fuel		
a	There is stored chemical energy inside the food we eat.	(	)
	Energy can't be transformed from one form to another.	(	)
T	Coal is produced from the remains of dead trees that died n	nillions	of
	years ago.	(	)
	Plants need sunlight to grow.	(	)
	We can use the energy of the Sun to produce electricity.	(	)
	All the energy that enters the energy chain reaches the devi	ice	
	completely.	(	)
	On pressing the spring of the soap dispenser, the soap move	s upwa	ırd.
		(	)
	Write the scientific term:		
4	The main source of energy for most forms of energies on Ec	arth.	
	Consideration	iri-fallandari dalikaraman dalik dalah darama is sa	)
	The energy produced when the wood of trees is burned. (	4>adddanaer - a tasasaa	)
	The form of energy that is stored in the battery of a remote	control.	
	(	MARAL M. STRTES TO	)
		STANDARD SAME SPECIAL PROPERTY IN	)
	A part of the soap dispenser that stores potential energy that	ıt is	
		648-1 և հետ - Իսկրանարվունդրվայնը իր	)
	A path that shows the energy flow from its source to the dev	ice.	
	( -2.0 April	MALL SERVICES CONTRACTOR	)
	Complete the following sentences:		
	In any energy chain, some of the energy is lost in the form of		
	The energies that are produced from the washing made	chine c	are
	energy and energy.		
9	can be used in electric power stations to generate e	electric	ity.
	During running, energy stored in the human body is	chang	ed
	into energy.		

#### Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
① Chemical energy	a. it is the energy produced during running.
Sound energy	b. it is the input energy in a soap dispenser.
3 Kinetic energy	c. it is the produced energy from the radio.
Potential energy	d. it is stored inside a tree.



#### Arrange the following steps according to:

#### Energy chain in a hair dryer:

- ( ) Electricity is transferred through huge wires to cities.
- ( ) Trees absorb light energy and store it as chemical energy.
- ( ) The Sun emits light energy that reaches the Earth.
- ( ) Heat, sound, and kinetic energies are produced.
- Ocal is burned in the electric power station.
- ( ) Electricity passes through wires to the hair dryer.

#### Study the following figures, then complete the following questions:



- energy is the output energy in all these figures.
- Figure (\_\_\_\_) depends on solar energy to be operated.
- Figures (\_\_\_\_) and (\_\_\_\_) can be controlled from a distance.
- The input energy of figure (\_\_\_\_\_) is the chemical energy stored in the battery.
- The input energy of figure (\_\_\_\_\_) is potential energy.

(	Energy and Fuel
6	Complete the following energy chain:
	energy (from the Sun)  converted into energy (stored inside the plant)
	The energy stored in food changes to energy, allowing us to move and do all activities.
	Give reasons for:
	1) The Sun is considered the main source of energy for all devices.
ı	
	2 Not all the energy that enters the energy chain reaches the device.
	There is a change in energy when burning wood of trees.
	During running, there is a change of energy happens in your body.

### Lesson 3





Activity 6 Energy and Everyday Devices

### Experiment 2



>> In this activity, you will use what you know about types of energy to describe the input and output energies of different devices.

إلى هذا النشاط، سوف تُستخيم ما تعرفه عن أنواع الطاقة لوصف مدخلات ومخرجات الطاقة للأجهزة المختلفة.

#### Tools:







#### (Steps)

- Analyze each device.
- Determine the input energy and output energy for each device.
- 3 Record your observations in the following table:

#### Results:

	1	1	5-
		•	7
1		Ę	

Device	Function		
1 Electric bulb	Lighting	Electrical energy	Light energy Thermal energy
2 TV	Display sound and image	Electrical energy	Light energy Sound energy
3 Electric iron	Ironing clothes	Electrical energy	Thermal energy
4 Electric heater	Warming	Electrical energy	Thermal energy
5 Electric bell	A la chi a a	Electrical energy	Sound energy
6 Hand bell	Alerting	Kinetic energy	Sound energy
7 Guitar	Playing music	Kinetic energy	Sound energy

Desica	ilide.di		
8 Toy car (it is operated by a spring)		Potential energy (stored in a spring)	Kinetic energy
9 Toy car (it is operated by a battery)	Toys for kids	Chemical energy (stored in a battery)	Kinetic energy
Watch	Knowing time	Chemical energy (stored in a battery)	Kinetic energy

#### Conclusion:

- Any device needs a source of energy to operate.
- Energy can be changed from one form to another.
- Some of the input energy escapes in other forms that the devices don't use to perform their functions.

يحتاج كل جهاز إلى مصدر للطاقة لتشفيله. يمكننا تحويل الطاقة من صورة الأخرى. فتسرَّب بعض مدخلات الطاقة داخل الأجهزة لصُور أحرى قد لا تستخدمها الأجهزة لأداء وظائفها.

#### Check your understanding?

#### >>> Put (/ ) or (/ ):

- 1 When you rub your hands together, kinetic energy is transformed into thermal energy.
- 2 During clapping, sound energy is produced. (



>>Mention the input and output energies for these devices:

(Heim	r=l=		Output Ene
Radio		BIOTEMAN November and manager as statistical distance of a manager at the state of the state	* residentalmen filmansserson. Not there i differential to mild or memberson.
2Fan			are one anagonapping states. Assure that the state of the paper of the large states and
3Blender		Magalanda da, securiores was providentamental way	
4 Flashlight		THE THERE BY A SECTION AND A SECTION AS A SE	** AbdressAdd & the 4-brownsommarbhrow is at installers.
5 Kettle		Tradatable 1000 and the control of t	
6Drum		2001-1010-10-year bry Abrahaled Served are on an Lean annual Addison. J. au.	The state of the s
7Curiosity Rover		-regionation (Amount State State State State of the Additional Processing on the	TO STREET AND ADDRESS OF THE PARTY OF THE PA



#### A ctivity 7/ The Conservation of Energy



#### >>> Put (√) or (X):

- Minetic energy is produced when we let the spring of a toy car.
- A toy car that is operated by a spring depends on chemical energy. (
  - In the previous lesson, we learned that energy can be transformed easily from one form to another.
  - Now, let's study some examples of energy transformation.

#### Example 🕕

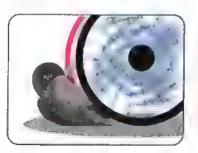
#### Energy chain while riding a bike



 When you eat your breakfast, thechemical energy stored in the food provides your body with energy.



 When you push pedals, chemical energy is converted intokinetic energy, which moves the bike.



 A part of the kinetic energy changes to thermal energy due to the friction between the wheels of the bike and the road.



#### Example Page Energy chain in the light bulb

 When you turn on a light bulb, the electrical energuthat powers the light bulb.



- Light energy. so the room becomes brighter.
- · Thermal energy, so you feel the heat when you approach your hand near the light bulb.

#### From the previous:

- >>The new energycannot be created from nothing.
- >>The old energydoes not disappear, but it changes from one form into another.
- >>This is called "The Law of Conservation of Energy".
  - لا يمكن أن تُخُلُق الطاقة الجديدة من العدم (لا شيء).
  - الطاقة القديمة لم تختف لكنها تتغير من صورة الأخرى.
    - هذا يُسمى «قانون حفظ الطاقة».



Energy is neither creatednor destroyed it can only be converted from one form to another.

قانون بقاء الطاقة - الطاقة لا تُفْنَى أو تُستحدث من العدم، ولكن يمكن تحويلها من صورة لأخرى.

#### Check your understanding?

- >>Put ( /) or ( /):
- Thermal energy doesn't help the light bulb to do its main job.(
- Our bodies store kinetic energy that allows us to move.

# Exercises on Lesson 3

Choose the	correct answe	r:	
The input end	ergy in the fridge i	senergy	
a.light	b.electrical	<b>c.</b> sound	d.kinetic
All the following	ng devices produc	ce thermal energ	gy, except the
<b>a</b> .hair dryer	b.watch	<b>c.</b> kettle	d.electric heater
Sound energ	y is produced fro	m all the follow	ing devices, except the
****>PI- GOOD MESSON Adams 6			
a.washing m	nachine	<b>b.</b> hair dryer	
c.mobile pho	one	d.electric iron	
The υ	ses the thermal er	nergy to do its fu	inction.
a.mobile pho	one	<b>b.</b> washing ma	achine
c.TV		<b>d.</b> hair dryer	
The c	hanges electrical (	energy into light	and sound energies.
<b>a</b> .washing m	nachine	<b>b.</b> TV	
<b>c</b> .radio		d.hair dryer	
6 The produced	d energy d	loesn't help the b	olender do its job.
<b>a.</b> sound	b.kinetic	<b>c.</b> chemical	d.potential
In all of these	devices, kinetic e	energy is conver	ted into sound energy,
except the	belanthaved tabangsapap - 🕏		
a.guitar	b.electric bell	c.hand bell	d.drum
When you tur	n on your television	on, the electrical	energy travels through
until it	reaches it.		
<b>a</b> .wires	<b>b.</b> air	c.screens	d.plastics
During riding	a bike, some kir	netic energy is o	converted into
energy due to	the friction of the	bike's tire with t	he road.
a.chemical	b.potential	<b>c</b> .thermal	d.electrical
During playing	g football, the che	mical energy ins	ide the body is
converted into	energy.		
a.light	b.kinetic	<b>c.</b> potential	d.electrical

	,	Energy and Fuel		
1		is a lost energy in the light bulb, but it isn't in the electric k	ettle	e.
		a. Light energy b. Thermal energy		
(C)		c. Chemical energy d. Sound energy		
		Put (✓) or (X):		
3		Both the electric bulb and the electric heater produce thermal en	erg	y.
	4		(	)
		When you rub your hands, kinetic energy changes to heat energi	y.	
			(	)
		The produced sound energy helps the blender do its function.		
			(	)
		Thermal energy is considered the input energy of electric heaters.	(	)
		Both the TV and mobile phone use batteries.	(	)
		Flashlights change chemical energy into light and thermal energi	es.	
			(	)
	<u>a</u>	There is energy loss when energy is transformed from one form t	to	
		another.	(	)
		When pedalling a bike, the chemical energy in your body change	es to	)
		kinetic energy.	(	)
		There is a stored chemical energy inside the food we eat.	(	)
		All the energy that comes from the Sun will reach our home devices	S.	
			(	)
		Energy is not necessary for some of our daily activities.	(	)
		Some devices are operated without the need for energy.	(	)
		The human body stores the same kind of energy inside batteries.	,	
2			(	)
		Kinetic energy changes to sound energy during clapping.	(	)

	Write the scientific term:						
	A device used to convert electrical energy into light e	energy.					
		(					
7	The energy produced when the wood of trees is burn	ned.					
		(1777-1971-1988-19811111 1615)					
I	The energy that is produced from the blender and h	elps it in doing its					
	job.	(					
I	The energy produced from playing the guitar.	()					
Į	The lost energy on using a computer.	(MENOPOLINI MENOPOLABBINI II III III )					
I	The energy that is always produced due to friction.	(					
	The energy stored inside all living organisms bodies.	(					
	The incoming energy of the light bulb.	(++					
	The output energy that helps the light bulb to do its n	nain job.					
		(,)					
	The main source of energy on the Earth.	()					
	1 The material that electric wires are made from.	()					
I	Energy can neither be created nor destroyed, but it	's only converted					
	from one form to another.	(polery of \$1,7190) 755-70000000+77500+10.500 almost about about about ord might					
	The energy produced from the electric lamp and affe	ects your eyes.					
1/2	Complete the following sentences:						
I	The electric lamp converts energy into light and	d heat energies.					
r	In the electric heater, energy is considered an input energy,						
	while thermal energy is considered an energy						
	To operate an electric mixer, we use energy.						
	Both sewing machine and vacuum cleaner produce	and					
	energies.						
-							

#### Complete the following using the words between the brackets:

(input - chemical - sound - kinetic - output - light)

The mobile	phone converts	chemical	energy	stored	in its	battery	into
Animhanachallachu 1993ai 1964deilleach	energy and	er	nergy.				

2	When y	ou ride	a bicycle,	the	· Married was a second		energy	stored	in your	body	İ\$
	convert	ed into	volume di lia Masi Millio 11	en	ergy, v	vhict	n makes	s the bio	cycle m	ove.	

The kinetic energy in a hand bell is considered as	energy
while in a small watch it's considered as energy.	

#### Cross out the odd word:

1 OOG - Dattery - Larry Coor	Food - Battery - Lamp - Coal	
------------------------------	------------------------------	--

TV - Mobile phone - Radio - Computer		
TV = Mobile priorite = riddio " Corripoter	Company of the second second second	

🗿 Hairdryer – Blender –	Washing machine	– Liaht bulb	()
and I fall al got - Dichact	TTOO INTO	Light Don	C. b. moreover a secondarion consequent

#### Choose from column (A) what suits it in column (B):

Column (A)	Column (B)	
Solar panels	a. converts the electrical energy into sound energy.	
2 Electric fan	b. changes the electrical energy into light and thermal energies.	
Radio	c. changes the electrical energy into kinetic energy.	
Electric bulb	d. changes the solar energy into electrical energy.	







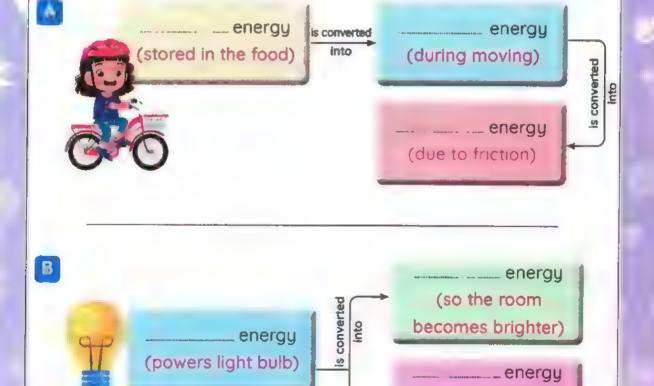
#### (8)

#### Complete the following table:

Input Energy	Device	Output Energy
	0	*ALIPS-OPENING For *1 promount of the Super STREET STREET
4 Neger at an approximate transportation of		April 18 - 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1
and water manufactor (M. Haddeller becker), manufactor (M. Haddeller becke	(3) U	MARK TO STATE OF THE PROPERTY OF THE STATE O



#### Complete the following diagrams:



(you feel warm

when you touch it.)

You turn on TV? (according to energy change)



#### Activity 8 Follow the Flow



#### >>> Put (√) or (X):

- Thermal energy helps the electric bulb do its function.

- Kinetic energy helps the blender do its main job.
  - Energy is conserved. It is neither created nor destroyed.
  - All the energy that goes into a device must eventually leave it in a different form.
  - The energy that goes in the device is called "Input energy".
  - The energy that comes out the device is called "Output energy".





Noise from a hair dryer seems like "lost energy".

Because sound energy doesn't help the hair dryer do its main function.

## Mobile Phone

Function: Light up - Ring - Process information



Input energy





**Output energy** 

Electrical energy

(when charging the phone.)

electrical energy is stored in battery in a form of chemical energy.

Light energy and sound energy



When using a mobile phone for a long time, some energy is lost.

Because thermal energy is produced and it does not help the mobile phone do its main functions.



## Check your understanding?

- >>> Put ( \( \sigma \)) or ( \( \times \)):
  - Electrical energy is used to operate hair dryer.
  - Sound energy is produced in both the hair dryer and mobile phone.
  - 3 Thermal energy helps the mobile phone to do its main job.
  - Some of the output energies don't perform the device's function. (





## Activity



#### **Build an Energy Chain**

# Experiment

>> In this activity, we will build an energy chain that shows the flow of energy and energy transformations.

· في هذا النشاط، سوف نقوم ببناء سلسلة طاقة تُوضِّح مسارات انتقال الطاقة وتحوُّلات الطاقة.

#### Tools



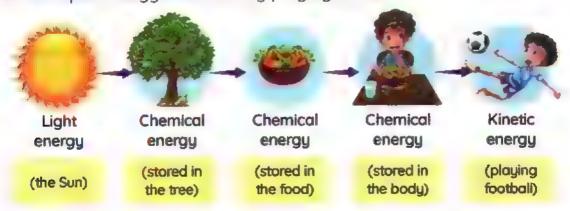
#### Steps

- Use the scissors to collect pictures from magazines that help you build an energy chain.
- 2 Label each picture in a suitable place on the construction paper using the tape.
- 3 Use the marker to illustrate the kind of energy for each picture.

(The energy chain must be at least 5 stages)

#### Result

For example: Energy chain during playing football





# Activity 10 Record Evidence Like a Scientist Energy in Remote-Controlled Cars



>> You have learned a lot about energy transformations and how different devices get the energy that they need to operate.

Question:
>> How can you describe the energy in a remote-controlled car now?

>> .	My Claim:	Hillithinishi saybassa ya seeccasiich-b-b-b	for where a resource and the state of the st	ddal y ad bel-ddd y wedd d hawl - maw g o g www yngyn o y y yd yngyn y y y y dd	4 P14 1/7 P793 D1 41+480-4300+4 - 14
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n	Evidence:				
<b>&gt;&gt;</b>	TETER STORES STO	tim vimbali jasa varyampynicynysessynycy 100400441	and carried and employee production and about decision and the little	(S): (ModS)ac-C-Soft-So-1 air massarersee so-is-sona	··· Saladaji ka ajasi eksil
	tem villiamir - van - van derheet vijn ji viele Abeerse derhe vinsemerenge spe	79 771 (1-6784) CEC (1884) Mile Mai Nobilla Labella de Labella de Mai de Marce - rea	<del>Моненский руду р</del> ози за 15 15 1886 г. 23 Минес		s servi a bin a a servi sanh a mod gas e quipe.
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# Exercises on Lesson 4

	Choose the correct answer:	
	During charging a mobile phone, to	the energy is stored in battery
ľ	as energy.	
	a. chemical - electrical	b. electrical - chemical
	c. electrical - sound	<b>d.</b> chemical - light
	When operating devices for a long	time,energy is produced as
	lost energy that doesn't help the d	evices to do any function.
	a. chemical	b. electrical
	c. thermal	d. sound
	All the following are from the con	sumed or produced energies in the
	mobile phone, except the	
-	a. chemical energy	b. light energy
	c. sound energy	d. potential energy
	All the following things store chem	ical energy, except
	a. trees	b. the light bulb
ı	c. the human body	d. batteries
ļ	Thermal energy is not considered	
1	a. mobile phone	b. washing machine
۱	c. electric fan	d. hair dryer
		y that helps the washing machine do
	Its function.	, Theresel and Electrical
	a. Kinetic <b>b</b> . Sound	c. Thermal d. Electrical
	Put (√) or (X):	
	The produced sound energy helps	the hair dryer do its function.
		( )
ı	Energy can be transformed from a	one form to another. ( )
	Sound energy produced by the ele	ectric mixer helps it do its function.
		( )
Į		

— • Energy and Fuel						
	The amount of energy entering any device equals the sum of the energies produced from it.  The amount of electric energy used to charge a mobile phone is greater than the produced light energy.  All the energy that enters the device leaks out in the form of heat.  Write the scientific term:					
	1 The lost energy prod	uced from the blender and you can hear it.				
		TING C HANTANTANAGO NG C MENGHIBRATEG MABIN				
	2 The lost energy wher	using the mobile for a long time.				
		total Mediate home to the deals had been tone				
	Choose from colum	nn (A) <mark>what suits it in</mark> column (B):				
	Column (A) Column (B)					
	Chemical energy     a. it is lost energy when operating a mobile device for a long time.					
	2 Light energy	b. it is used to charge the mobile battery.				
	3 Electrical energy	c. it is stored inside the mobile battery.				
	4 Thermal energy	d. it is produced from the mobile pnone.				
4	Give reasons for:	3 4				
4		ced from the blender is a lost energy.				
2 Thermal energy produced from the electric heater isn't lost energy.						
	What happens if?					
	You operate your mo	bile device for a long time?				
	kti. Izenklib. Obaz ladin izani aktiklatikanciba (ib. ). Shazzari amumi aktikar wazazi	- Securificación de Campan de Caraci de Campan				

# Model Excins on Concept 3.1

		Model E	xam/iii			
8	uestion (1)					
	(A) Choose the co	rrect answe	er:			
	The produced	energy	doesn't help the	blender do its	job.	
	a. sound b	kinetic	c. chemical	d. potentio	ıl	
	② Curiosity Rover is designed to explore					
-	a. the Sun	the moon	c. Mars	d. Earth		
	Electric wires are	made of	material.			
	a. plastic b			d. copper		
	All the following of					
	a. hair dryer b	. watch	c. kettle	d. electric	heate	r
	(B) Write the scien					
	The energy produce	d when the w	ood of trees is t	ourned. (		)
)	trestion (2)					
	(A) Put (\( \sigma \) or (\( \sigma \):					
	<b>Operating remote</b>	ely means bei	ing controlled fr	om a distance.	(	)
						)
	3 The amount of e	electric energ	y used to char	ge a mobile p	hone	is
l	greater than the	amount of lig	ht energy prode	uced.	(	)
	When you rub yo	ur hands, kine	etic energy char	nges to heat en	ergy.	
					(	)
	(B) Cross out the	odd word: F	ood - Battery -	Lamp - Coal	(	)
)	uestion (3)					
	(A) Choose from c	olumn (A) v	vhat suits it ir	column (B):		
	(A)		(B)			
	1) Chemical	a. it is lost en	ergy when ope	ratina a mobile		
	energy		a long time.	amig a mobile		
	2 Light energy		o charge the mo	obile batteru		
	3 Electrical energy		inside the mobi			$\dashv$
	Thermal energy		ced bu the mob			-

#### (B) Give a reason for:

Noise from a hair dryer seems to be "lost energy".

### Model Exam 2

Consensation	A 18
4 . 7 . 4 . 76	•

(A)	Choose	the	correct	answer:
da	_			

- Batteries store \_\_\_\_ energy inside them.
  - b. electrical a. chemical
- d. kinetic c. solar
- During riding a bike, some kinetic energy is converted into energy due to the friction of the bike's tire with the road.
  - a. chemical
- b. potential
- c. thermal
- d. electrical
- The uses the thermal energy to do its function.
  - a. mobile phone **b.** washing machine **c.** TV
- d. hair dryer
- A Some energy is lost in most devices in the form of \_\_\_\_\_energy. a. electrical **b.** thermal
  - - c. sound c. kinetic

#### (B) Write the scientific term:

The lost energy when using a computer.

/		
/		-
	-	

#### Question (2)

#### (A) Put (√) or (X):

- Mars is located a few kilometers away from Earth.

)

- The energy chain of a burning candle is composed of chemical energy converted into thermal energy and light energy.
- There's no lost energy when you turn on washing machine.
- The produced sound energy helps the blender do its function.

#### (B) Cross out the odd word:

Hairdryer - Blender - Washing machine - Light bulb.

(			
bammeter m. et fan - oet metaddande et skuldseldel.	(		

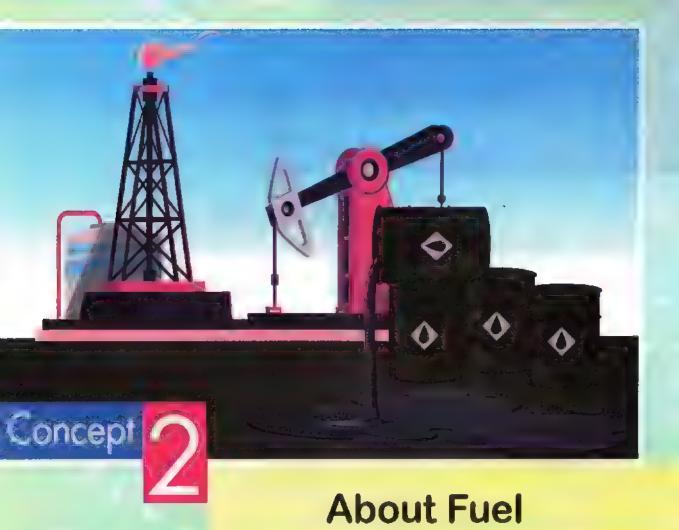
#### Question (3)

#### (A) Complete the following table:

Device	Input Energy	Output Energy
1 Blender	M No ATTENDAD LINEAR AGAIN TO ME MILL SAGRELLANDO - NO. 10	n wir mameri mam momerordamus. Vi belde (delde) 1 del 12 del 2011 et 2011
2 Kettle	The The Therman Add to be made to be the transfer of the trans	· Marie had more removed the control of the second relationship and
3 Hand bell	The state of manual is a second confirmation in	The sale of the sa

#### (B) What happens if?

You turn on an electric fan? (According to energy changes).



## Commun Objections

#### By the end of this concept:

- Students can describe patterns in how different types of fossil fuel are formed and predict the properties and uses of different types of fossil fuel.
- Students can describe how the use of energy and fuel affects the environment.

### First Versalisationy?

- Energy efficiency
- Fossil fuel
- Fuel
- Generate energy
- Pollution
- Renewable energy resources
- Nonrenewable energy resources

# Concept 2

# **About Fuel**

Activity 1	Can You Explain?	
Activity 2	Fuel and Road Trips	
Activity 3	What Do You Already Know About Fuel?	
	and the state of t	
Activity 4	Types of Fuel	
Activity 5	Oil and Water	
	has the same to make the same to make the same to make the same to make the	
Activity 6	Fossil Fuel Formation	
Activity 7	Living Without Electricity	
Activity 8	Using Fossil Fuel to Generate Electricity	
	The second secon	
Activity 9	Big City Environmental Concerns	
Activity 10	Activity 10 Burning Fossil Fuel and Pollution	
Activity 11	Conserving Fossil Fuel	
	The state of the s	
Activity 12	Using Fuel	
Activity 13	Record Evidence Like a Scientist	

# LESSION





>> Humans use many forms of fuel in their daily lives, such as:

#### Gasoline



used in moving cars.

#### Natural gas



used in cooking.

#### Coal



used in warming.

Fuel: A substance that produces thermal energy when it is burned.



- · Gasoline is made up of oil.
- Oil, coal, and natural gasare extracted from the underground
  - البنزين هو وقود مشتق من النفط.
  - يُستَمْرِج النفط والقحم والغاز الطبيعي من باطن الأرض.
- Fuel is burned in electric power stations to generate electricity.
  - يحترق الوتود في محطات الطاقة لتوليد الكهرباء.







# Activity 2 Fuel and Road Trips



#### >> Choose the correct answer:

Cars need \_\_\_\_\_ to move.

(food - fuel)

As the speed of the car increases, the amount of used fuel

(decreases - increases)

If the fuel runs out, the car will stop moving.



When going on long trips in the car, we must check the gasoline pointer.

If you notice a drop in the gasoline pointer, you should go to the nearest gas station.



 عند الدهاب في رحلات طويلة باستخدام السيارة، يجب أن نتحقّق من مؤشر الوثود.

• إذا لاحطت انحفاضًا في مؤشر البنزين، فيجب أن تذمب إلى أقرب محطة وقود.

#### How is a car operated



- Gasoline burns inside the car's engine. (Thermal energy)
- The car's engine rotates the wheels of the car. (Kinetic energy)

• يحترق الوقود في محرك السيارة، فيتمكّن المحرك من تدوير عجلات السيارة.







### A ctivity 3 What Do You Already Know About Fuel?

- >> We use fuel in many different ways every day.
- >>> Fuel stores chemical energy inside it.
- >>> Fuel is used as a source of thermal energy when it is burned.

#### Uses of Some Types of Fuel



Gasoline or natural gas are used in operating all means of transportation.

Oil, natural gas, or coal are used in generating electricity.





Coal or wood are used in warming houses.

Coal, natural gas, or wood are used in cooking food.



# Exercises on Lesson 1

1	Choose the co	rrect answer	•	
d	All the following	are found deep	ly under the Earth's	surface, except
į	a. coal	b. oil	c. natural gas	d. green plants
	② Is consid	ered as the mai	in source of energy	on the Earth.
	a. A plant	b. The Sun	c. The moon	d. Fuel
	Cars need	to move on t	ne road.	
	a. batteries	b. water	c. coal	<b>d.</b> gasoline
	As fuel burns ins	ide the,	the wheels of the co	ar rotate.
	a. tires	b. battery	c. engine	d. airbag
	nergy is	s stored inside o	coal.	
	a. Thermal	b. Solar	c. Chemical	d. Electrical
	If we are going a	on a long trip in	the car, we must ch	eck the
	a. seats		b. engine	
	c. speedometer		d. gasoline poin	ter
	Coal is used in a	II the following	purposes, except	ov. 300 Addinages t
	a. warming hou	ses	b. watching the	TV
	c. cooking food		d. boiling water	
	is /are u	sed in operating	g all means of trans	portation.
	a. Gasoline	b. Coal	c. Natural gas	d.a and c
	Puel is used as a	source of	energy.	
	a. thermal	b. chemical	c. light	d. solar
	10 You can burn	to feel wa	rm in your home in	winter.
	a. gasoline	b. coal	c. wood	<b>d.</b> b and c

Put (✓) or (X):	
Oil, coal, and natural gas are extracted fron	m underground. ( )
2 As the speed of the car increases, the amou	unt of used fuel decreases.
	( )
Short trips consume more fuel than long tri	ps. ( )
We cannot drive a car if the gasoline inside the	he fuel tank runs out. ( )
5. When the gasoline pointer is close to ze	ero, it means you need to
recharge the car batteries quickly.	( )
6 Coal can be used to move our cars if they s	stop suddenly. ( )
Thermal energy is produced by burning a p	piece of wood. ( )
Water could be used to warm our houses of	n cold winter days. ( )
© Cars, buses, and bicycles need gasoline to	run on roads. ( )
Write the scientific term:	
1 The main source of most forms of energy of	on Earth.
2 A device that helps the car driver check the	,
A liquid fossil fuel that burns inside the car e	
The kind of energy that is stored in fuel.	()
5 A form of energy produced by burning fuel	
Complete the following using the words	
(Oil - coal - gasoline pointer - electricity - wood -	
such as coal and natural gas a	
2 When the is near to zero, you r	nust go fast to the nearest
gas station.	
Some forms of fuel, such as an	a can be used
in warming.	
natural gas, and coal are used i	in electric power stations to
generate electricity.	

### Choose from column (A) what suits it in column (B):

\*

Column (A)	Column (B)
1. Gasoline pointer	a. gasoline burns inside it.
2 In a car engine,	b. makes the car move and stop.
3 Car wheels	c. helps us check fuel in the car.

(h) \_\_\_\_\_(2)

(3)

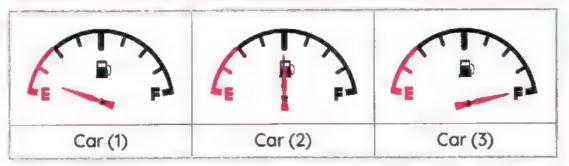
8

Column (A)	Column (B)
1 Chemical energy	a. it is generated in power plants.
2) Kinetic energy	b. it is stored inside fuel.
Thermal energy	c. it is produced when the car wheels rotate.
Electrical energy	d. it is produced when burning a piece of coal.
.124 / 255	

•

Column (B) Fuel
a. Coal, natural gas, or wood
b. Coal or wood
c. Oil, natural gas, or coal
d. Gasoline or natural gas

#### Study the following figures, then complete the following questions:



Th	nis	devi	ce is	called	-physical regular designation and the second	and i	t helps	the	driver	check	the

- The driver in car (\_\_\_\_) needs to go quickly to the nearest gas station.
- 3 The fuel tank is full with gasoline in car (\_\_\_\_\_).
- Half the amount of gasoline is remaining in car (\_\_\_\_\_).

#### Give reasons for:

- Gasoline is very important for cars to move.
- The fuel (gasoline) pointer is very useful for drivers.

#### What happens if?

- We burn a piece of coal?
- 2 The fuel pointer in the car becomes zero?
- 3 Gasoline is burned inside the car's engine?

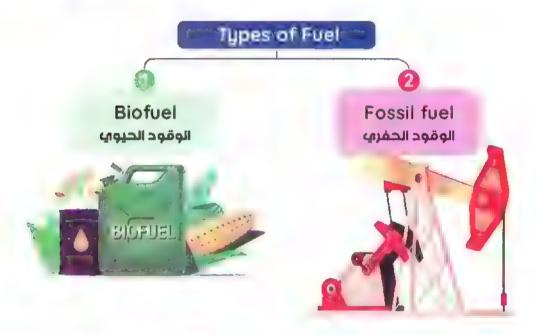
# Lesson 2



#### >> Put (/) or (X):

- Gasoline is a liquid that is used as fuel for cars.
- Both coal and wood are used in warming.

Fuel: & It is a material that releases thermal energy when burned. الوقود: هو مادة تُثْتُج طاقة حرارية عند حرقها.



# Give reasons for...



- Biofuel is considered a renewable source of energy. Because it is renewed by the continuous growth of plants.
- Fossil fuel is considered a nonrenewable source of energy. Because they are gone and cannot be easily renewed.



#### **Biofuel:**

#### (Renewable resource of energy)

It is the fuel that is made from living things that can be planted.

الوقود الحيوى: هو الوقود الذي يُنتُج من الكائنات الحية التي يمكن زراعتها.

Examples:







- >> Wood is the most ancient fuel; it is still used all around the world.
- >> Charcoal is made from wood.
- Liquid fuel is made from grass, corn, and wood chips.

• يُعتبر الخشب من أقدم أنواع الوقود، وما زال يُستخدم في جميع أنحاء العالم. • يُصنع الفحم النباتي من الخشب،

و يمكن تحويل العشب والذرة ورقائق الخشب إلى وقود حيوى سائل.

#### **Biofuel Conservation**



Using wood as fuel requires cutting down trees.



- Cutting down trees at a faster rate leads to deforestation.
- Deforestation has a negative impact on our environment.
  - قَطْع الأشجار بوتيرة سريعة يؤدي إلى إزالة الفابات.
- · استخدام الخشب كوقود يتطلب قَطْم الأشجار.
- إزالة الغابات لها تأثير سلبي على بيئتنا المحيطة بنا.

 Some trees grow a few centimeters every year and reach their full height in more than one person's lifetime.

· هناك أشجار تنمو سنتيمترات قليلة كل عام، ويستغرق اكتمال نموها مدة أطول من غُمَّر الإنسان.



#### Fossil fuel:

#### (Nonrenewable resource of energy)

• It is the fuel that was formed from the remains of plants and animals that were buried and decomposed over millions of years ago.

#### Examples:









- >>> Coal is formed from the decomposition of ancient plants remains.
- >>> Oil and natural gas are formed by the decomposition of the remains of ancient sea animals.
- **Secoline** is a fuel that is formed from oil.
  - بتكون الفحم من تحلّل بقايا النباتات الجافة القديمة.
  - بتكرُّن النفط والغاز الطبيعي من تحلُّل بقايا الكائنات البحرية القديمة.
    - ه البيزين هو وقود مشتق من النفط،
  - Fossil fuel are extracted from underground.
  - · Fossil fuel are formed very sowly over millions of years, which means that we use them faster than they are formed.



- الوقود الحقرى يُستخرج من باطن الأرض.
- تَشَكَل الوقود الحفري ببطء شديد على مدى ملايين السنين، وهذا يعنى أننا نستخدمه بشكل أسرع من معدل تكونه.

#### Formation of Coal

- Over millions of years ago, large areas of Earth were covered with plants and swamps.
- When these plants died, their remains were covered with hundreds of meters of mud and rocks under the Earth's surface.
- 3 Earth's heat and pressure turned these remains into coal.
  - 🔞 منذ ملايين السنين، كانت مساحات كبيرة من الأرض مقطاة بالأشجار والمستنقعات.
  - 2 عندما ماثث تلك النباتات، غطتها مئات الأمتار من الطين والمسخور تحث سطح الأرض.
    - 🛐 بقعل الحرارة والضغط تحوَّلت بقايا النباتات الجافة إلى قحم.

#### **Important Comparisons**

POC				
Definition	It is the fuel that was formed from the decomposition of plants and animals remains that lived millions of years ago.	It is the fuel that is made from living things that can be planted.		
Examples	<ul><li>1 Coal</li><li>2 Oil</li><li>3 Natural gas</li><li>4 Gasoline</li></ul>	<ul><li>1 Wood</li><li>2 Grass</li><li>3 Corn</li><li>4 Charcoal</li><li>5 Liquid fuel</li></ul>		
Primary Source	The Sun			
Renewable or Nonrenewable	Nonrenewable resource	Renewable resource		



## Activity 5 Oil and Water





- >> Oil and water are two types of resources that humans can use.
- >> There are some similarities and differences between oil and water.

#### Oil and Water





 Both oil and water can be used to generate electricity.

ويمكننا استخدام النفط والماء لتوليد الطاقة الكهربية.





- · Oil is a nonrenewable resource, while water is a renewable resource.
  - النفط مورد غير متجدد، بينما الماء مورد متجدد.

# Nonrenewable

 They are natural resources that are used faster than they can be replaced.

• المصادر عبر المتحددة هي مصادر طبيعية تُسْتَهْلُك بمعدل أسرع من معدل تجدُّدها.

#### Renewable resources

 They are natural resources that can be replaced soon after they are used.

• الصحار استدده في مصادر طبيعية تتجدُّد بعد وقت قصح من الاستخدام،



#### Oil: Nonrenewable resource of energy

- Oil is extracted from underground.
- >> Oil is formed from the decomposition of ancient sea creatures.

#### Formation of Oil







Millions of years

Today

#### Over many millions of years ago,

>>> marine organisms died, their remains settled on the sea floor.



- >>> Layers of sediments and rocks cover the remains of the marine organisms.
- Over time, those remains were converted into oil due to extreme heat and pressure.

منذ ملايين السنين، ماتت الكائنات البحرية واستقرت في قام المحيط.

<sup>»</sup> تراكمت طبقات الصخور والرواسب على الكائنات البحرية المدفونة.

مع مرور الوقت، تحوَّات تلك البقايا إلى نفط تحت تأثير الضفط والحرارة الهائلين.



#### Water



- Although water is renewable, we must use it carefully and not waste or pollute it.
- If we waste or pollute water, it may not be replaced as quickly as we need.
  - على الرغم من أن المياه مصدر متجدد، إلا أنه يجب علينا استخدام المياه بحرص وعدم إهدارها أو تلويثها.
    - إذا قمنا بإهدار المياه أو تلويثها، فقد لا نستطيع تجديد المياه بالسرعة والمقدار الذي نحتاجه.

### Give a reason for...



- Water is considered a renewable resource of energy.

Because water is available and hasn't run out yet.



#### How can we conserve these resources



#### We can conserve oil by:

- Oriving less.
- Using public transportation.

#### We can conserve water by:

- Growing plants that don't require a lot of watering.
- 2 Avoid polluting water.



# Exercises on Lesson 2

Choose the cor	rect answer					
is considered the main source of energy on the Earth's surface.						
a. Wind						
-			d, except			
a. coal		_	•			
🗓 🕦 Ancient people u	sed	. as a form of fu	el before discovering			
gasoline.						
a. wind	b. wood	c. oil	d. coal			
is a rer	newable resou	rce of energy.				
a. Oil	b. Coal	<b>c.</b> Gasoline	d. Corn			
All the following re	epresent renev	vable resources o	of energy, except			
■ 200円 (アイフ) - 14、17年 (200円 140円 201円 201・4+0+0+2・M ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・						
a. wood	<b>b</b> . coal	c. charcoal	d. grass			
Coal is formed du	e to the decor	nposition of anci	ent dead			
a. plants	b. animals	c. humans	d. birds			
(2) consumer ls made						
a. Gasoline						
All the following a						
a. wood chips			d. grass			
Charcoal is descri	bed by					
a, being limited	1	b. existing under				
c. being a fossil fuel  d. being made from wood  Natural gas is formed from the decomposition of under						
		·	or under			
extreme pressure						
a. plants and anir	riuis	<ul><li>b. sea creatures</li><li>d. trees</li></ul>				
C. Dilds		u. li ees				

	- Energy and Fuel		
	takes millions of years to be formed.		
	a. Coal b. Charcoal c. Wood d. Corn		
2	One of the disadvantages of overusing biofuel is		
	a. overfishing <b>b</b> , wildfire <b>c</b> . deforestation <b>d</b> . rain		
	Both water and oil		
	a. are renewable resources b. are nonrenewable resource	es	
	c. have the same structure d. can be used to generate el	ectrici	ity
1	Put (✓) or (X):		
	The Sun is the primary source of forming both biofuel and fos	sil fue	_
lex.	The sort is the printing source of londing both biologic and loss	(	)
	Coal is the oldest fuel that has been used all over the world by	ancie	ent
	people.	(	)
	Biofuel is one of the nonrenewable sources of energy.	(	)
	Fossil fuel is made from living things that can be planted.	(	)
	All types of fuel are extracted from underground.	(	)
	The consumption rate of coal is slower than its formation rate	. (	)
	Burning fossil fuel causes deforestation and pollution.	(	)
	The amount of oil, water, and air on Earth is limited.	(	)
	We can conserve oil by using public transportation.	(	)
	10 Water may not be replaced as quickly as we need.	(	)
	We should plant crops that need a large amount of water to a	:onser	rve
	water.	(	)
	Some plants are used to make liquid biofuel.	(	)
4	Write the scientific term:		
	The main source of energy for most forms of energies on Ear	th.	
	(		)
	A material that releases thermal energy on burning. (		
Ω	It is a natural resource that is used faster than it can be replace		
-			. )
	· ·	_	

Is a natural resource that can be replaced soon af	ter it is used.
It is the fuel that is made from living organisms that	can be planted.
	()
lt is the fuel that is extracted from deep ground	under the Earth's
surface.	()
A kind of fossil fuel that is produced from the deco	mposition of dead
marine organisms.	(
A fossil fuel that is produced from the decomposition	on of dead plants.
	()
A kind of biofuel that is made from wood of trees.	()
(ii) A kind of biofuel that is made from corn and grass.	()
A phenomenon that happens by cutting trees at a	faster rate to get
biofuel.	()
Complete the following using the words between	en the brackets:
(wood - deforestation - underground - oil)	
Ancient people used in cooking food and w	_
Gasoline is made from, while coal is extract	ed from
Cutting trees with a fast rate causes	
(coal - heat - increased - Oil - nonrenewable - decrea	sed - renewable -
pressure)	1 1 6 11
Extreme and are the factors formation of faccil fuel underground	needed for the
formation of fossil fuel underground.	-l.f
is formed from the decomposition of a shall is formed from the decomposition of trace	,
is formed from the decomposition of trees	
Water is considered a/an resource of en a/an resource of energy.	ergy, where oil is
The rate of consumption of fossil fuel must be	
I HE TULE OF CONSTRUCTION OF TOSSITUE HIDSEDE	B

#### Energy and Fuel



#### Choose from column (A) what suits it in column (B):



Column (A)	Column (B)			
1 The Sun	a. takes a very long time to be formed.			
2 Fossil fuel	b. takes a short time to be formed.			
3 Biofuel	c. is the primary source of all kinds of energy.			



Column (A)	Column (B)
1 Liquid fuel	a. was used by ancient people.
2 Gasoline	b. is made from grass, com, and wood chips.
3 Charcoal	c. is a fuel that is made from oil.
<b>▲</b> Wood	d. is made from wood.

### 6

#### Classify these environmental changes in the following table:

Oil - Charcoal - Gasoline - Natural gas - Com -Grass - Wood - Coal - Water - Wind

Renewable Resourc	e of Energy	Nonrenewable	Resource	of Energy

W	***************************************	
*	the American de de	difference recommender or arbanismostic constitution of the second secon
DECEMBERS OF		MA SECURIO DE MASON DE LA CONTRACTION DEL CONTRACTION DE LA CONTRACTION DE LA CONTRACTION DE LA CONTRA
.eseamradihasemmass m	**************************************	44.444-04-04-04-04-04-04-04-04-04-04-04-04-

Arrange the foll coal:	owing steps accordi	ng to the formation of		
a () The tree has	() The tree has been transformed into coal over millions of years.			
<b>b</b> () The tree rem	ains are buried under the	Earth's surface.		
© () The tree rem	ains are exposed to high p	pressure and temperature.		
d () An old tree d	ied.			
8 Arrange the follo	wing steps according	to the formation of oil:		
a () They fall on t	a () They fall on the bottom of oceans.			
() The organism	() The organisms are exposed to high pressure and temperature.			
() They are cov	ered with rocks and sedin	nents.		
() Some marine organisms died.				
() Over millions of years, these remains are transformed into oil.				
Cross out the od	d word:			
Wood - Oil - Corn	- Charcoal.	( no se anne es malament annuny per pint ( pin = 100000000000000000000000000000000000		
Sun - Wind - Water - Coal.				
Coal - Charcoal - I	Coal - Charcoal - Natural gas - Oil.			
Grass - Wood chips - Corn - Coal. ()				
Compare between:				
P.O.C Fossil Fuel Biofuel				
	1 03011 1 001	Dioloci		
Renewable or Nonrenewable	- phy 344 My 48 64 64 65 Confury 6 and Mark Mark Mark Confury 1 and 1 an	NAME NAME NAME AND ASSESSMENT OF THE PROPERTY		
Nonellewable				
Examples				

P.O.C	Coal	Charcoal
Type of Fuel	-914-(49-88595595959-) FFILINGENIA PARAMETER BARBARA BARBARA PARAMETER BARBARA	1 m i be no anni didica (11 la
Primary Source	-to-t-resident/2004-0730; 1650-1650-1650-1650-1650-1650-1650-1650-	ne creatives wroman ser. Newworldship do p. in digitalistic database de la la digitalistic de la d
Renewable or Nonrenewable	The Committee and the Committee of the C	h als albackeelde Mede. Met et a Miller Medell and de fere de la de fere de la de fere de fere de fere de fere

Give	reasons	for

- Fossil fuel is considered a nonrenewable resource of energy.
- Biofuel is considered a renewable resource of energy.
- Cutting trees at a faster rate to get wood has a negative impact on our environment.
- Coal is considered a type of fossil fuel.

#### What happens if?

- The marine creatures remainings decompose under the Earth's surface?
- We cut down trees at a faster rate than they can grow?
- The remains of dead plants are exposed to extreme heat and pressure?



## Activity 6 Fossil Fuel Formation



- >> The following are the steps involved in the formation of fossil fuel, write them in the correct order:
  - (\_\_\_\_\_) The remains are changed to become coal, oil, and natural gas.
  - (\_\_\_\_) The remains were buried.
  - (\_\_\_\_) Living things that lived a long time ago died.
  - (\_\_\_\_\_) Heat and pressure affected the remains.





Activity 7 Living Without Electricity

#### Electricity can be generated from

Renewable Resources

Such as (Water - Wind)



Nonrenewable Resources

Such as

(Oil - Natural gas)



- In many regions, electricity is generated from nonrenewable resources.
- Using renewable resources is beginning to increase.

Whatever the resource of energy is renewable or nonrenewable. we should conserve it.



# Experiment (

) In this activity, we will document your experience of spending some time without using electricity.

• في هذا النشاط، سوف تُسجِّل ملاحظاتك عن قضاء بعض الوقت بدون استخدام الكهرياء.

#### **Steps**

- 1 Turn off all the electricity in the house for two hours.
- 2 Write about your experience and answer the following questions:

#### Questions and answers:

- a Do you see anything in the dark?
  - I can't see anything in the dark.
- **b** What are the devices you have used?
  - I've used a candle instead of the lamp.
  - I've used a paper and a pen instead of a computer.
- How did you feel after this experience?
  - I was bored and I appreciate electricity more now.

#### Conclusion:

>>> Electricity is very important in our lives and we should conserve it.



#### How can we conserve electricity



- 1 Turn off the lights we don't need.
- 2 Unplug electrical devices after using them.
- Set a regular electricity-free time.







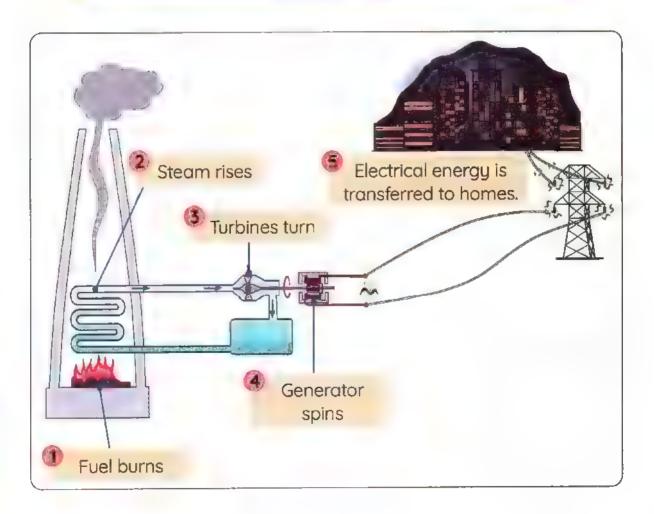
# Activity 8 Using Fossil Fuel to Generate Electricity

THE I WELL I OF INTE	>> Put	(1)	or	(X):
----------------------	--------	-----	----	------

We should let electric devices work all the time.	(	)
---	---	---

We can conserve electricity by using saving light bulbs.

### **Generating Electricity Using Fossil Fuel**



#### 1 Fuel burns

· When fuel (coal, oil, or natural gas) burns, it releases thermal energy.

# Steam rises

This thermal energy is used to heat water to produce steam.



The steam is directed to tubes to turn turbines.

## **4** Generator spins

 Turbines make the generator spin and convert kinetic energy into electrical energy.

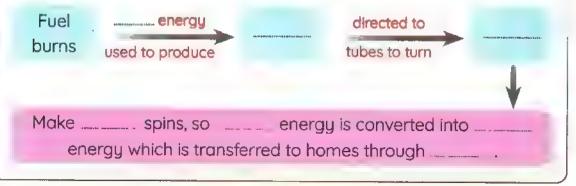
# 5 Electrical energy is transferred to homes

 Electrical energy travels through cables to homes, businesses, and factories.

1 حرق الوقود	عندما يحترق الوقود (الفحم أو النفط أو الغاز الطبيعي) يُنْتِج طاقة حرارية.
[2 يرتفع البخار	تُستخدم هذه الطاقة الحرارية في تسخين المياه لتكوين بخار الماء.
ق تتحرك الثوربيئات	يُوجُه البخار إلى أنابيب لتشفيل التوربينات،
4 يدور إلمولا	تعمل التوربينات على دوران المواد؛ وبالتائي يتم تحويل الطاقة الحركية إلى طاقة كهربية،
5 نقل الطاقة الكهربية للمنازل	تنتقل الطاقة الكهربية عبر الكابلات إلى المنازل والشركات والمصانع.

# Check your understanding?

Complete the following diagram:



# Exercises on Lesson 3

Choose the co	rrect answer:		
In many regions	s, is gener	ated from nonren	ewable resources.
a. oil	b. natural gas	c. electricity	<b>d.</b> wood
② is use	ed instead of lamp	s when electricity	is turned off.
a. Candle	b. Wool	c. Paper	d. Radio
3 How can you co	onserve electricity?	?	
a. By turning of	f the lights when I	don't need them.	
b. By unpluggin	ng electrical applia	nces.	
	egular electricity-f	ree time.	
d. All answers a	ire correct.		_
	gy is produced by		
a. Chemical	<b>b.</b> Sound	<b>c.</b> Thermal	d. Solar
By heating water	er, it turns into		
<b>a.</b> steam	b. ice	c. electricity	<b>d.</b> fuel
6 chan	ige kinetic energy	into electrical er	nergy in the power
plants.		2.1.6	d E I
a. Engines	<b>b.</b> Generators		d. Fuel
The steam prod	duced in the electr	ic power station	is directed to tubes
to turn			d laura
	<b>b.</b> motors		
	y travels through		
a. tubes	b. motors		d. fans
	are încl		
a. Heating - coo	_	b. Burying - coo	_
c. Decaying - h	eating	d. Decaying - g	rowth

	Energy and roof		
	10 Water is turned into steam by the effect of energy.		
	a. electrical b. thermal c. kinetic d. mecha	nical	1
1	Put (✓) or (X):		
	The movement of a generator in an electric power station p	rodu	ces
•	potential energy.	(	)
	Water is a nonrenewable resource.	(	)
	We can use renewable and nonrenewable energy resources to	)	
	generate electricity.	(	)
	Turbines are operated by steam in electric power stations.	(	)
	Turning on the lights that we do not need helps us conserve ele	ectric	ity.
		(	)
	Turbines make the generator spin to generate electrical energy.	(	)
	Using energy-saving light bulbs conserves electricity.	(	)
	You should unplug an electric iron after using it.	(	)
	On cooling water, it turns into steam in electric power stations.	(	)
1	Write the scientific term:		
	The energy resources that include wind energy and water ener	rgy.	
	The second secon	(-n-Makkampapmag	)
	The energy released from burning fossil fuel. (	M1444012	)
	The energy produced by the generator.	4 Hekker Hekker vanner i	)
	A matter that is produced from heating water in an electric pov	ver	
	'station. (	dana sananang laga	)
	A device that operate generators.	hethhermoon;	)
	A device in an electric power station that changes the kinetic el	nera	y
	into electrical energy.		

	Complete the following	ng using the words between the brackets:		
	(natural gas - generators - electric - coal - steam - kinetic)			
	Turbines in electric power stations are turned by, and they			
		to run the of the electric power		
_	stations.			
		changes the energy into		
	energy.	an burning in a land to		
	power stations.	by burning or in electric		
4		(A) what quita it in actumn (D).		
-		(A) what suits it in column (B):		
	Column (A)	Column (B)		
	(1) Generators	a. produces thermal energy.		
	Turbines	b. produce electrical energy.		
	Burning fuel	c. is produced from heating water.		
	Steam	d. produce kinetic energy.		
	①			
Cross out the odd word:				
	Decomposition - Moonlight - Extreme heat - High pressure.			
	()			
	Water - Oil - Coal - Natural gas. ()			
Arrange the following steps for generating electricity at an				
ĺ	electric power station:			
	() Steam starts to move the turbines.			
	() The oil or natural gas burns to produce thermal energy.			
	() Electricity is transferred through cables to cities.			
	-	onverts the kinetic energy into electrical energy.		
	( ) Thermal energy is used to heat water and produce steam.			

共

# CLES OF



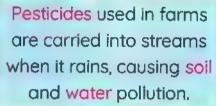


## **Big City Environmental Concerns**

 The increase in people's needs and their industrial and agricultural activities causes many pollution problems.

## Sources of Pollution in Big Cities

Burning fuel produces smog that pollutes the air.





Using chemicals in factories pollutes the air, water, and soil,



يُنْتُج عن حرق الوقود الضباب الدخاني الذي يلوث الهواء.



المبيدات الحشرية المستخدمة في الزارع تشتلط مع مياه الجداول عند سقوط الأمطار؛ مما يسبب تلوث التربة والمياه.



للواد الكيميائية المنتخدمة في المصائم تؤدى لتلوث الهواء والياه والتربة.

## Effects of Air Pollution on Humans' Health

Smog from cars and factories in big cities causes:

- 1 Irritation of humans' eues
- 2 Irritation of humans' lungs
- 3 Damages the tissues of the respiratory system.



يتسبُّب الضباب الدخاني الصادر من السيارات والمصانع في المدن الكبري في:

[2] تدمير أنسجة الجهاز التنفسي،

[2] تهيُّج الرئة.

🚹 تهيُّج عيون الإنسان.



 Smog is full of harmful small particles that irritate the lungs and cause damage to the tissues of the respiratory system.





## Activity 10 Burning Fossil Fuel and Pollution



- · Over time, the demand for energy has increased in order to supply electricity to homes, schools, businesses, and factories.
- The solution was to generate electricity by burning fossil fuel at the power plants.





- بمرور الوقت، زاد الطلب على الطاقة من أجل توفير الكهرباء للمنازل والمدارس والشركات والمصائع.
  - كان المل هو حرق الوقود الحفري في محطات توليد الكهرباء لتوليد الكهرباء.

## Harms of Burning Fossil Fuel

- >> Burning fuel produces carbon dioxide gas, which is considered the main reason for acid rain and global warming.
  - **Acid Rain:**

## How it is formed:

· Carbon dioxide gas combines with water in the air to form acid rain.

## Harms:





(5) Chemical changes in the structure of lakes cause the death of fish.

Decomposition of some rocks, including bricks of buildings.

🗓 موت الأشجار. 🍳 التغيرات الكيميائية في تركيب التربة. 🌊 التعيرات الكيميائية في تركيب البحيرات؛ مما تسبب في موت الأسماك.

. [4] تحلُّل بعض الصحور وطوب المباني،



## @ Global Warming:

### How it is formed:

- The amount of carbon dioxide gas in the air increases forming a layer in the atmosphere.
- This layer traps heat on the Earth, causing a slow rise in the Earth's temperature.



💈 تُحبِس هذه الطبقة المرارة على الأرض؛ مما يؤدي إلى ارتفاع درجة حرارة الأرض بنطء.





## How to reduce acid rain and global warming



The only solution is to conserve energy.

ه الحل الوحيد لوقف الأمطار الحمضية والاحتباس الحراري هو الحفاظ على الطاقة.

Reducing energy we use.

causes

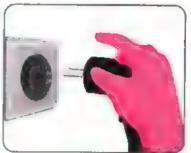
Reducing the fossil fuel we burn,

causes

Reducing carbon dioxide we put in the air.

ترشيد استهلاك الطاقة يُقلل حرق الوقود؛ مما يُقلل كمية غاز ثاني أكسيد الكربون في الهواء،





Conserving fossil fuel makes them last longer and keeps
 the Earth clean.
 الحفاط على الوقود يحعله يدوم لعترة أطول ويعنع تلوُّث كوكب الأرض.





## Activity 11 Conserving Fossil Fuel



## From the previous lessons, we have learned that:

- >> Fossil fuel is considered nonrenewable natural resource of energy.
- >> Fossil fuel takes millions of years to form, which means that they can't be replaced as quickly as we consume them.
- >> Fossil fuel will run out of the Earth if consumption is not rationalized.

## Conserving Fossil Fuel



Walking or biking instead of driving a car.

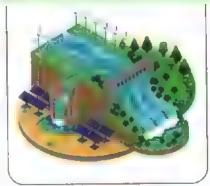


Turning off the lights when you aren't in a room.



Replacing fossil fuel with renewable energy resources, such as:

- Solar energy.
- 2 Hudroelectric energy.
- 3 Wind energy.



 Using renewable energy resources to generate electricity is more expensive than using fossil fuel.

## Disadvantages of Using Fossil Fuel

- Possil fuel is limited and could run out.
- When fossil fuel burns, it emits gases that cause:
  - a. Air pollution
- b. Acid rain
- c. Global warming



# Lesson 5



# Activity 12 Using Fuel



>>> Classify the following resources in the following table:

POC	NITH TOTAL	
1 Coal		~
2 Charcoal		
3 Wood		
4 Oil		
5 Natural gas		
6 Solar energy		
7 Wind energy		
8 Gasoline		
9 Water		
10 Liquid fuel		



# A ctivity 13 Record Evidence Like a Scientist



>> Now, try to think like a scientist by writing your hypothesis (claim), your evidence, and your scientific explanation about one of the main points of this concept.

2	
4	Question:

How can you describe fuel and road trips now?

PROFESSION AND AND AND AND AND AND AND AND AND AN	paalaganing intermediate from the control of the co	and the second to the second t	100 to 10	populari, distribution distribu	
AMERICA STATE STAT	e assus e se sherus shehr 54: 4004- 2004	populari matemati e e mere e e e e e e e e e e e e e e e	(464-68) - 14 European Arabia - Seria (es 1) - ser a seria servicio de 164 decembros de 164	ус-ургуруус зал малуштин каншибы эээмссэн швоо	B
Evidence	ce:				
photography by the state of the					hada oʻshildoʻrdalishid Mildis b 100 siddoʻlilli 100 et e e e
Marie Marie Co.	"No that is, more arrays a pair - year throat beight also me	makensa : a suma suma suma suma suma suma suma su	(-type-game)	Angel Naphallian and minutes and minutes provided by FEED	Not I to Bild 100701500 The Towns of Tay
The part of the same are a new man and a safet fair or the water 16th and 15th and 1	· 李· [6] · 李· [6] · [6]	tor y or Nadahi Nadahi Makabi	पण कर क पर राज्यों ने की करते प्रश्नवें ने मंत्रिन हैं। प्रश्नवें ने मंत्रिन हैं। प्रश्नवें ने मंत्रिन हैं। प्रश्नवें ने मंत्रिन हैं।	ddd baddin c me' - ydd yddd Philet - 142 (1988) - 198 178 199 198 199 199 199	paman no valdekeman reteteder
Scientif	fic Expland	ation with R	easoning:		

# Exercises on Lessons 4 and 5

	Choose the cor	rect answer:		
10	Using chemicals i	n factories pollute	S	
	a. air		b. water	
	c. soil		d. all the previo	us
9	Smog damages t	he tissues of the	system.	
	a. digestive	b. circulatory	c. respiratory	d. nervous
	Burning fossil fuel	produces	mbanguloures #	
	a. natural gas	b. oxygen gas	c. carbon dioxic	le d. oil
6	The death of tree	s is a result of	100-00-018-00-01811 MIA 4	
	a. overfishing	b. acid rain	c. wind	d. temperature
	Cars' smog cause	s Irritation of hum	ans'	
	a. small intestine	b. brains	c hearts	d. eyes
	Acid rain is forme	d when	combines with w	ater.
	a. oxygen		b. carbon dioxid	łe
	c. hydrogen		d. nitrogen	
9	The burning of for	ssil fuel causes		
	a. global warming	9	<ul><li>b. deforestation</li></ul>	s
	c. acid rain		d. a and c	
•	To reduce air poll	_	_	
		transportation		
63	c. drive cars faste		d. conserve foss	
6	Using vehicles the	,		
,et		b. solar energy	•	
T	Increasing the am	nount of gas	s in the atmosphe	ere causes global
	warming.		b saudo o o discussi	I_
	a. hydrogen		b. carbon dioxid	e
100	c. oxygen		d. nitrogen	and a survey of face
(1)	Erosion of building			are caused by
	a. global warming	)	b. oxygen gas	
	c. deforestation		d. acid rain	

	- Chergy and rue			
	When mixes with water of canals and rivers and soil pollution.	, it causes	wat	ter
	a. carbon dioxide b. smog c. pesticides	d. rain		
	Carbon dioxide traps in the atmosphere causes		min	a.
	a. gases b. water vapor c. pressure	d. heat		_
ı	Using to produce electric energy is expensive.			
	a. solar energy b. oil c. natural gas	d. coal		
	Burning fossil fuel produces			
	a. thermal energy b. carbon dioxide	3		
	c. chemical energy d. a and b			
	Burning fossil fuel causes all the following, except	4FA++)PERESH++PIN- #		
	a. pollution b. acid rain			
	c. global warming d. deforestation			
	Put (✓) or (X):			
C	Acid rain causes soil and water pollution.		(	
<u></u>	When the burning rate of fossil fuel increases, the	temperat	ure	of
	Earth decreases.	·	(	)
	Mixing water with oxygen gas produces acid rain.		(	)
	Acid rain can decompose some rocks.		(	)
	To reduce global warming, we must conserve nonrene	wable reso	ourc	es
	of energy.		(	)
	The amount of fossil fuel on Earth is unlimited.		(	)
	Increasing the ratio of carbon dioxide in the air red	uces the E	Eartl	h's
	temperature.		(	)
	Acid rain leads to physical changes in the structure of	lakes and	soil.	
				)
	Burning fossil fuel causes global warming.		(	)
	@ Global warming is one of the disadvantages of usi	ng tossil	tuel	
	energy generation.		(	)
	Acid rain irritates the humans' eyes and lungs.		(	)
	Large particles found in smog cause air pollution.		(	)

4	Meita the scientific t	orm:	
	Write the scientific t		
ļ	It is a phenomenon in	which the Earth's temperature inc	creases, when
	carbon dioxide gas inci	reases in the air.	(*************************************
	It is a substance that co	suses the decomposition of some	rocks and the
	death of trees.		()
	A gas that causes glob	al warming and acid rain.	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	The energy resources	that include solar energy and hy	droelectricity
			(recens bale to contary magnature) exp. (exp. (e
	The energy resources t	hat include all kinds of fossil fuel.	
		and irritates humans' eyes and lu	
		and innated national agod and is	()
	Complete the following	ng using the words between th	e brackets:
	(climate - water - soil - r	enewable - air - nonrenewable - ti	emperature)
	_	e must use resources	_
		enomenon that raises the	or Earth
	and changes its	profession for the contract of	
	Smog causes	pollution.	
	Pesticides cause	and pollution.	
1	Choose from column	(A) what suits it in column (E	3):
	Column (A)	Column (B)	
	( Oil	a. causes global warming.	
	Water Water	b. runs out faster than wind	

COIOIIII (A)	COIOIIII (D)	
( Oil	a. causes global warming.	
Water	b. runs out faster than wind.	
Carbon dioxide	c. irritates our lungs.	
Smog	d. is a renewable resource.	
	<b>6</b>	

# Energy and Fuel Arrange the following steps that explain formation of acid rain: ( \_\_\_\_\_) The ratio of carbon dioxide gas increases. **b** ( Acid rain is formed. ( ) Carbon dioxide combines with water vapor. d ( \_\_\_\_) It causes the death of trees and fish. ( ) Factories cause air pollution. Compare between: **Global Warming Acid Rain** P.O.C Reason of Formation Disadvantages Give reasons for: It is necessary to conserve energy. Fossil fuel amount on Earth is limited. Engineers work on Improving solar vehicles. Farmers should avoid the overuse of pesticides. What happens if? The ratio of carbon dioxide increases in the air? The consumption of fossil fuel is not rationalized? 3 Acid rain falls on buildings? Factories discharge a lot amount of chemicals into a city?

	Mod	iet Exam/		
d	Duestion (1)			
Ī	(A) Choose the correct a	inswer:		
	.1 Ancient people used	as a form of fuel befo	re discovering gasolin	e.
	a. oil b. coa	c. charcoal	d. wood	
	2 Fuel is used as a source	of energy.		
	a. thermal b. che	mical <b>c</b> . light	d. a and c	
	3 If we are going on a long	g trip in the car, we m	ust check the	
	a. seats b. airb	ag c. speedome	ter d. gasoline pointer	
	44 takes millions of	years to be formed.		
	a. Coal b. Cha	rcoal c. Wood	d. Corn	
	(B) Write the scientific t	erm:		
	A device in the electric power	er station that change	s the kinetic energy int	0
	electrical energy.		Conferencialization television and interest and interest and supplications	)
C	Question (2)			
	(A) Put (\( \sigma \) or (\( \times \):			
	1 As the speed of the car is	ncreases, the amount	of used fuel decrease	S.
			(	)
	2: Fossil fuel are made from	m living things that ca	n be planted. (	)
	3 When the burning of for	ssil fuel increases, the	e temperature on Eart	h

## decreases.

(B) Cross out the odd word: Coal - Charcoal - Natural gas - Oil.

## Question (3)

## (A) Choose from column (A) what suits it in column (B):

4. Using energy-saving light bulbs conserves electricity.

(A)	(B)
1 Liquid fuel	a. was used by ancient people
2 Gasoline	b. is made from grass, corn, and wood chips.
3 Charcoal	c. is a fuel that is made from oil.
<b>№</b> Wood	d. is made from wood.

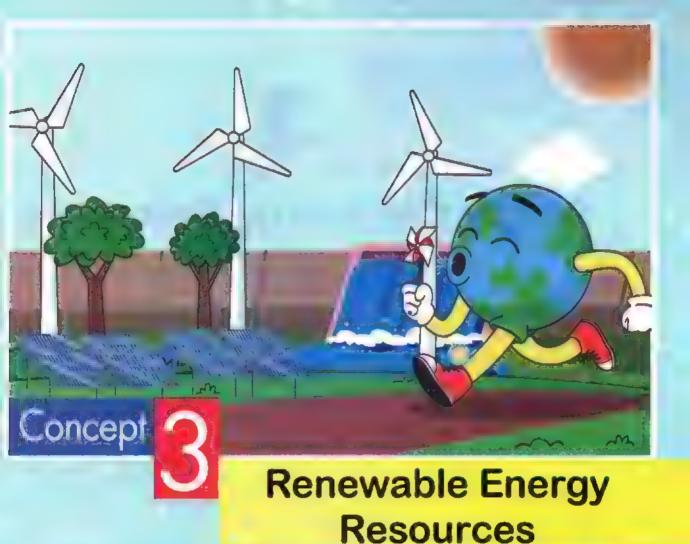
## (B) Give a reason for:

Fossil fuel is considered a nonrenewable resource of energy.

o MODEL EXAMS on Concept 2

All the following	are found deep	oly under the Earth	i's surface, except
a. coal	b. oil	c. natural gas	d. green plants
② is consider	ered the main so <b>b.</b> Fuel	urce of energy on t	he Earth's surface. d. Water
One of the disaction of	dvantages of over b. wildfire	erusing biofuel is c. deforestation	
Coal is formed a plants	underground due b. animals	e to the decomposi c. humans	tion of deadd. birds
(B) Write the sci	entific term:		
The energy resource	ces that include	all kinds of fossil fu	el, (
uestion (2)			
(A) Put (/) or (X)	):		
All types of fuel	are extracted fr	om underground.	( )
When cooling w	ater, it turns into	steam in electric po	ower stations. ( )
The amount of	fossil fuel is limit	ed on the Earth.	
Thermal energy	j is produced fro	m burning a piece	of wood. ( )
(B) Cross out the	odd word: Su	n – Wind – Water –	Coal. (
uestion (3)			
(A) Arrange the f	ollowing steps	according to the	formation of oil:
() They fall	to the bottom of	f oceans.	
() The orga	nisms are expos	ed to high pressure	and temperatures
() They are	covered with ro	cks and sediments.	
(	arine organisms	died.	
Over millinto oil.	lions of years, th	nese remains have	been transformed
(R) What hanne	ne 167		

The remains of dead plants are exposed to extreme heat and pressure for millions of years?



## L'ancapt Objectives

## By the end of this concept:

- Students can apply scientific ideas to design, test, and refine devices that convert energy from one form to another.
- Students can explain the use of renewable resources in the generation of electricity.
- Students can develop models based on observations and evidence that energy is transferred from one place to another.

## Key Vocabulary.

- Heat
- Light
- Radiation
- Solar energy
- Turbine
- Watermills
- Windmills

# Concept 3

# Renewable Energy Resources

Activity 1	Can You Explain?				
Activity 2	Windmills and Watermills				
Activity 3	Using Energy from the Sun				
Activity 4	Solar Energy				
Activity 5	Activity 5 Harness the Wind				
Activity 6	Falling Water				
Activity 7	Hands-on Investigation: Modeling a Turbine Generator				
	E1				
Activity 8	Record Evidence Like a Scientist: Windmills and Watermills				







>> In the previous concept, we have learned that

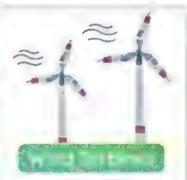
Renewable resources of energy:

They are natural resources that are replaced (renewed) in a faster rate than that of being consumed.

>> We can generate electricity using different renewable energy resources. Such as:



to light streets using solar energy.



Generate electricity using the kinetic energy of wind.



## Water Turbines

Generate electricity using the kinetic energy of water.

- In this concept we will study:
- Renewable energy and its resources.
- Wind turbines and water turbines.
- >> The uses of solar energy.
- Generating electricity using the wind's movement.
- Generating electricity using the water's movement.





# Activity 2 Windmills and Watermills



- Imagine you were born 400 years ago.
  - · Life was hard, and people needed machines to make their lives easier.
  - · Windmills and watermills were used to crush graine to make flour.

## Windmill







## Way of working

- The wind moves the mill's blades.
- The kinetic energy transfers to the internal parts of the mill.
- The water moves the mill's blades.
- The kinetic energy transfers to the internal parts of the mill.

## **Importance**

They are used to crush (grind) grains and make flour.



## **Advantages**

- Low cost.
- Renewable energy resource.

## **Disadvantages**



- Sometimes the wind doesn't blow, so it can't do its main job.
- · Sometimes, the water supply may dry up, so it can't do its main job.

Machines	الآلات	Windmill	الطواحين الهوائية	Watermill	الطواحين المائية
Blades	شفرات	Internal Parts	الأجزاء الداخلية	Cost	تكلفة
Blow	تهب	Dry up	تجف		

## Modern turbines are used now instead of old windmills.









## **Function**

- They are used to generate electricity.
- They are used to grind the grains to make flour,

### **Differences**

- They are taller than windmills.
- They have fewer blades than windmills.
- They have no opening in their blades.
- They are shorter than wind turbines.
- They have more blades than wind turbines.
- They have openings in their blades.

## Similarity

They depend on the kinetic energy of wind to be operated.

# 1

## Check your understanding?

- >>> Study the opposite figures, then complete:
  - Figure (\_\_\_\_) uses electricity to make wind.
  - Figure (\_\_\_\_) uses wind to make electricity.



The device in figure (\_\_\_\_\_) is used to generate electricity that is used to operate the device in figure (\_\_\_\_\_).

Modern turbines	التوربينات الحبيثة	Old windmills	الطواحين القديمة
Function	الوظيفة	Openings	فتحات



# Activity 3 Using Energy From the Sun

- The Sun is the main source of all kinds of energy on the Earth.
- The Sun provides us with light and heat.



Even at night, you feel the warmth of the Sun.

Because the atmosphere, water, and Earth's surface absorb the Sun's energy, causing a rise in the Earth's temperature.

## Solar Energy

- Energy received from the Sun is called solar energy.
- We can use solar energy as a source of thermal energy.
- · Sun rays are called radiant energy (radiation).

92) Science Prim. 4 - Second Term



- أيطلق على الصاقة الصادرة من الشمس الطاقة الشمسية.
- نستخدم الطاقة الشمسية كعصير للحصول على الطاقة الحرارية.
  - يُطلق على أشعة الشمس الإشعاع أن الطاقة الإشعاعية.



## Greenhouses:

## **Importance**

 They help farmers plant the crops that only grow in warm climates.



### How does it work?

- 1 A greenhouse allows the entry of light and radiant energy from the Sun.
- 2 Radiant energy changes into thermal energy inside it.
- 3 Thermal energy warms the greenhouse from inside.

### و الأهمية:

تساعد المزارعين على زراعة المحاصيل التي لا تنمو إلا في المناخ الدافي،

- كيفية عملها.
- 👔 تسمح المنوية الزراعية بمرور الضوء والطاقة الإشعاعية للشمس.
  - [2] تتحوُّل الطاقة الإشعاعية إلى طاقة حرارية.
  - [3] تقوم الطاقة الحرارية بتدفئة الصوية الزراعية من الداخل.

## Warming:

## **Warming Ourselves**



- · Solar energy can be used directly · Houses can be built in a way that as a source of thermal energy when exposing yourself to the Sun to feel warm.
  - بمكن استخدام الطاقة الشمسية مباشرة كمصدر للطاقة الحرارية عند تعريض نفسك للشمس لتشعر بالدفء.

## Warming Houses



- enables the energy of the Sun to warm them by placing large windows on the wall that faces the Sun.
  - ، يمكن بناء النازل بطريقة تُمكّن طاقة الشمس من تدفئتها بوضع نوافذ كبيرة على الحوائط المواجهة للشمس،

## Cooking Food:

## Convergent (concave/curved) mirrors:

 They collect and focus sunlight to heat a metal pot and cook the food inside.



تُستخدم الرايا المجمعة (المقعرة/المنحنية) لتوجيه أشعة الشمس لأواني الطهى لطهى الطعام بداخلها.

## Heating Water:

## Solar water heater

### Structure:

• It contains panels made of black pipes.



### Location:

• It can be placed on the roof of a house.

## How does it work?

- 1 As water passes through the pipes, it heats up.
- 2 Water can then be stored in a hot water tank to be used later.
  - التركيب: تتكون من ألواح شمسية مصنوعة من أنابيب سوداء.
    - الموقع: تُوضع على أسطح المنازل.
      - و كيفية عملها.
    - 🗍 يتم تسخين الماء عندما يمر عبر تلك الأنابيب.
  - 🙎 يتم تغزين الماء الساخن في خزان الماء الساخن للاستخدام في وقت الحق.

# 1

# Check your understanding?

- >>> Put ( / ) or ( X ):
  - The output energy of a solar water heater is thermal energy. ( )
  - We feel the warmth of the Sun because it is visible all day. ( )

# Exercises on Lesson 1

	Choose the cor	rect answer:		
	All the following of	are considered rer	newable resources	of energy, except
	estudo ≈ 14-10-mpeessen €			
	a. wind	b. coal	c. the Sun	d. water
2	Which of these is	an example of a	renewable energy	resource?
	a. Gold	b. Petroleum	c. Water	d. Aluminium
3	The main function	n ofis grir	nding the grains a	nd making flour.
	a. modern turbin	es	<b>b.</b> solar panels	
	c. dams		<b>d.</b> watermills	
	Both modern win	d turbines and old	d windmills are sin	nilar in their
	a. blades numbe	r	b. ways of worki	ng
	c. height		d. blades shape	
	One of the disadv	vantages of wind	energy is that	
	a. its cost is high		b. it does not blo	w sometimes
	c. It can't be rene	ewed	d. It is limited	
	In wind turbines, t	he energy o	of the wind is chan	ged into electrical
	energy.			
	a. kinetic	b. thermal	c. sound	d. light
		are than c		
	a. longer			d. slower
	The source of all	energies on the E	arth is/are	4
	a. planets	b. the moon	c. the Sun	d. stars
(3)	Which of the follo	wing structures is	used by humans t	o capture and use
	sunlight as an en	ergy resource?		
	a. Cranes	b. Dams	c. Solar cells	d. Turbines
10	Using concave m	irrors in cooking i	s one of the benef	its of using
	a. wind	b. water	c. sand	d. solar energy
	_			

(		o E	nergy and Fuel			_		
		11	The output of sol	ar panels is	energy.			
			a. solar	b. electrical	c. sound	d. light		
0	THE PERSON NAMED IN	12	Solar energy is u	sed in food	d.			
Y			a. cooling	b. preserving	c. cooking	d. freezi	ng	
	Н	13	In winter, greenho	ouses help farmer	s grow plants tha	rt need	1000000 PHOT 4	
	Н		a. warm weather	r	b. cold weather			
vC.			c. less water		d. less sunlight			
	6		Put (✓) or (X):					
		1	Windmills can do	their job all the tin	ne, as the wind ne	ever stops	blowi	ng.
							(	)
		2		energy of the wind	d increases, the w	indmill blo	ides s	pin
			faster.			. *	(	)
		3		nd turbines and a	old windmills are	used to	genero	ate
			electricity.	ated by wind turbin	os is transmittos	l through	the wi	od.
		1 ~	Electricity genero	ited by will torbii	ies is transmitted	rtmoogn	uie wi	)
		5	The power source	e for the electric fo	an is wind.		(	)
		6		kinetic energy into		Ų.	(	)
		7		oines are shorter t	_	_	(	)
		8	Greenhouses help	farmers grow plant	ts that need cold w	veather.	(	)
		9	We use solar ene	ergy to preserve fo	ood.		(	)
		10	We feel the warn	nth of the Sun duri	ng the day only.		(	)
	1		Write the scien	tific term:				
			The energy resor	urces that include	wind energy and	water en	ergy.	
						Colorbations	ano i i divo akalikuwi suvia sia	)
		2	The primary sou	rce of energy on E	arth.	(**************************************	-0.4.4.4.4.0.5 dibiridak libiri dara kera la	)
		3	They are used to	collect and focus	sunrays towards	the cook	ng po	ts.
						(		)
		4	A device that the	wind rotates its bi	lades for generat	_	_	
			A -l-, -1		and the territory	•	t to each connected as a market of	-
		5	A device that cor	nsists of black pipe	es used to heat w	ater. (	l èr	)

Complete the fo	ollowing sentences:	
When the wind t	urbines rotate,	energy is converted into
energ energ	y.	
2 Both wind and wo	ater movement produce	energy, which is
used to rotate tur	bines to generate	energy,
Renewable energ	y resources include	and
and	are nonrenew	able resources of energy.
6 Old windmills are	than modern	n wind turbines.
6 The number of bl	ades in modern wind tu	orbines is than in
old windmills.		
7 We can use solar	energy in cooking using	concave , which
collect and focus t	he onto the	metal pots to heat them.
help fo	rmers grow crops that r	need warm weather.
	for each of the follo	wing:
A renewable resou		(1) m - other reference properties of the contraction
2 A nonrenewable re	esource of energy	(
Compare between	an.	
J compare server	511.	
P.O.C	Old Windmills	Wind Turbines
Function	seed like control is in Arthurapy uses majoral-collection or mass made	The Individual management of the terminal and the second of the second o
Number of Blades	W. D Apper measurement of distributions in the Personal Science Section 1985	Share we make the Mann recommendation to be the same of the same o
Height		
		The state of the variety of the state of the

227

## Choose from column (A) what suits it in column (B):

•	~		
		10	٠.
			_
		e	-
	-	-	-

Column (A)	Column (B)
Wind turbines	a. were used to grind grains.
Solar panels	b. convert the kinetic energy of wind into electrical energy.
<b>Old</b> windmills	c. are used in heating water.





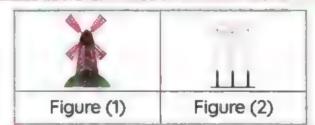




Column (A)	Column (B)
<b>®</b> Greenhouses	a. are used in heating water.
Concave mirrors	b. are used in planting some kinds of crops.
Panels of black pipes	c. are used in cooking food.

## 8

## Study the following devices, then complete the sentences below:



- Figure (\_\_\_\_) is used to grind grains.
- Machine in figure (\_\_\_\_) is shorter than machine in figure (\_\_\_\_).
- Both of them are similar in \_\_\_\_\_.
- Both of them depend on \_\_\_\_\_\_.



## Study the following figures, then answer the questions below:

- The opposite figure represents a solar oven:
  - a. What is the type of the mirror that is used in this device?





b. What is the importance of this device?

The opposite figure represents a panel of black pipes:
a. The input energy is
b. The output energy is
c. It is placed at
What happens if?
Wind moves the blades of windmills?
Wind doesn't blow in an area that contains wind turbines?
Give reasons for:
Solar energy is a renewable resource of energy.
People used windmills and watermills 400 years ago.
People now use modern wind turbines.
People depend on different machines in their lives.
You feel the warmth of the Sun at night.
Greenhouses are very important to farmers.

# Lesson 2

# ctivity

## Solar Energy

## >>> Put (√) or (X):

- 1 Energy received from the Sun is called solar energy. ( )
- 2 Even at night, we can feel the warmth of the Sun's energy. (

## Solar Panels

## PHILIP

Most solar panels are used to generate electricity.

تُستخدم معظم الألواح الشمسية لتوليد الكهرباء.

It consists of a large number of small solar cells.

تتكون من العديد من الخلايا الشمسية الصغيرة.

## (He-lines-tell)

• Solar cells catch the radiant energy coming from the Sun and turn it directly into electricity.

تلتقط الخلايا الشمسية الطاقة الإشعاعية للشمس وتُحوُّلها مباشرة إلى كهرباء.

Mangillians

## Solar panels can be



 To supply only one light bulb with energy.



 To supply buildings or cities with energy.



## With of the course personnel by such party

1 It can be used directly to light streets.



2 It can be used to operate electric devices.



It can be used to recharge some types of batteries, like solar-cell calculators.



It can be used to power irrigation equipment in some villages.





## Check your understanding?

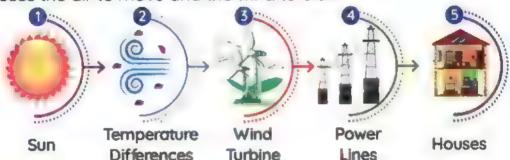
- >>> Put (√) or (✗):
  - The electrical energy is considered the input energy of solar panels.
  - Some calculators run on batteries powered by small solar cells.( )
  - Houses may use electricity produced from rooftop solar panels.( )
  - Small panels can supply energy to whole buildings.
    ( )





## Activity 5 Harness the Wind

- As the Sun warms Earth, it warms the air.
- >> Different parts of the world get different amounts of solar energy which causes the air to move and the wind to blow.



- Solar energy causes the air to move and the wind to blow.
- The kinetic energy of wind rotates the blades of wind turbines that are used to spin generators.
- Generators change kinetic energy into electrical energy.
- Electricity is transferred through big wires towards cities to light houses and streets.
  - 🕥 تتسبُّب الطاقة الشمسية في حركة الهواء وهيوب الرياح.
  - [2] تقوم الرياح بتدوير شغرات التوربينات الهوائية التي تقوم بدورها بتشغيل المولدات.
    - [3] يقوم الموك بتحويل الطاقة الحركية إلى طاقة كهربية.
    - 👔 تنتقل الكهرباء عن طريق أسلاك شخمة إلى المن لإنارة المنازل والشوارع.



When the kinetic energy of the wind increases, the blades rotate faster.

## Check your understanding?

- >>> Put (√) or (X):
  - Minetic energy of the wind can be used to generate electricity. (
  - Generators can be used to spin wind turbines.

# Exercises on Lesson 2

	Choose the correct a	nswer:	
	Solar panels can be used	to operate all the following, except	
ı	a. a calculator	b. gas oven	
	c.irrigation equipments	d. street lights	
4	The energy of the	Sun causes air movements and wind blo	wing.
	a.chemical <b>b</b> .radio	ant c.electrical d.sound	
	The difference in temper	ature between cold and hot air causes	· In-women
	a.rain b.a she	adow c. wind blowing d.a rainbov	N
	©change the kineti	c energy of turbines into electrical energ	jy.
	a. Motors b. Pane	els <b>c.</b> Generators <b>d.</b> Fans	
İ	The correct arrangemen	t for generating electricity from wind er	nergy
ı	is:		
	a. Sun – wind – power lin	es - wind turbines - houses	
	b. Sun - wind - wind turb	pines - power lines - houses	
	c Sun – wind turbines – p	power lines - wind - houses	
	d. Sun – wind turbines – v	wind - power lines - houses	
	Which statement is true?		
	a The wind rotates the b	lades of watermills.	
	b. Electricity is transferred	d to cities through wind.	
ļ	C Solar energy causes th		
l	Generators are used to	·	
l		turbines is transmitted into houses and	
	factories through		
	the wind <b>b.</b> solar	panels c.generators d.wires	
	Put (√) or (X):		
	A solar cell consists of a l	arge number of small solar panels. (	)
	A calculator's output ener		)
		33	

	3 Solar cells are designed to capture the radiant energy of the Sun.	(	)
	Small solar panels may be able to light buildings.	(	)
)	5 When the kinetic energy of the wind increases, the wind turbine	blac	set
	spin more quickly.	(	)
ı	6 Generating electricity by wind turbines depends on the kinetic	ener	gy
ı	of water.	(	)
	Wind energy is a clean source of energy.	(	)
	8 Wind turbines are placed in windy areas.	(	)
4	Write the scientific term:		
1	1 A device that the wind rotates its blades for generating electric	ity.	
	(		)
	2 It produces radiant energy that causes the wind to blow. (	******	)
a	The device in an electric power station that turns kinetic ener	gy i	nto
	electrical energy.		)
	Complete the following sentences:		
	1) The Sun the Earth and the air.		
	2 Solar energy causes the air to and the wind to		HENERAL *
	3 The generator converts energy into en	ergy	
	4 Electricity is transferred to cities through		
	5 It some villages, solar panels are used to generate	ene	rgy
	that used to operate		
4	To generate electricity, arrange the following figures	s fro	om
7	start to end:		
		44	
		1	
	6-	1-450	1

W	nat happens if?
<b>1</b> Th	e wind rotates the blades of the turbine?
1993-944	
2 Th	e kinetic energy that is applied on the wind turbines increases?
	/e reasons for:
	e Sun helps in blowing the winds.
Ph   11	
-	
2 Ge	nerators have an important role in a power plant.
**1	

# Lesson 3

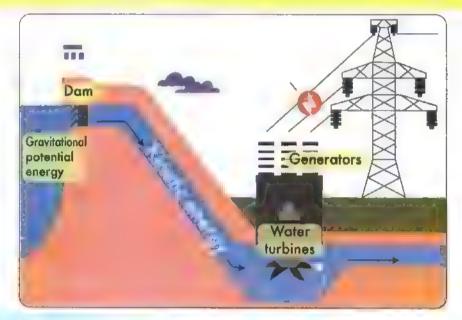


## Activity 6 Falling Water

- As rivers run downhill, they change gravitational potential energy into kinetic energy.
- GR Dams are built on rivers?
- To control the flow of water.
  To increase potential energy of water.

## How can water be used to generate electricity





- A hydroe.ectric dam holds back the flow of water to increase its potential energy.
- When the water is released, it passes through the blades of turbines, so they rotate.
- Turbines operate generators, so kinetic energy is converted into electrical energy.
- Electricity is transferred to cities through long electric wires.

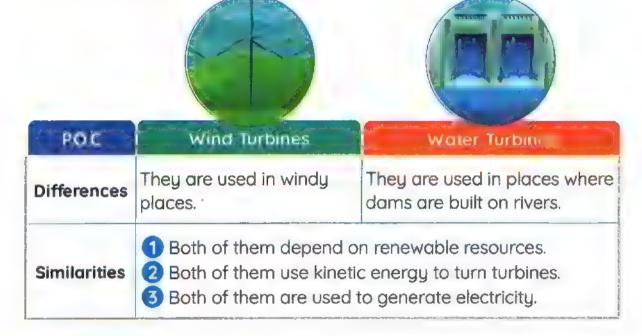
آ يقوم السد بإيقاف سريان المياه؛ مما يؤدي لزيادة طاقة وضع المياه 2 عند تحرير المياه، تسقط المياه على شفرات التوربينات؛ مما يؤدي لدورانها. 3 تقوم التوربينات بتشفيل المولدات؛ فتتحوّل الطاقة الحركية إلى طاقة كهربية. 4] تنتقل الكهرباء إلى المدن عبر أسلاك كهربية طوبلة.

## Hydroelectricity: (Hydroelectric energy)

It is a type of electrical energy generated by water turbines in dams.

الطاقة الكهرومانية: هي نوع من الطاقة الكهربائية تُولُّدها التوربينات المائية في السدود.

>> The following table explains the similarities and differences between wind turbines and water turbines:



# Check your understanding?

	of (*) of (*).		
1	The electricity produced by water is known as electron	nagne	etic
	energy.	(	)
2	Dams are built in places with a strong wind.	(	)
3	Wind turbines and water turbines are renewable energy re	sourc	es.

As the kinetic energy of the water increases, the blades rotate faster.



## A ctivity



## Hands-on Investigation: **Modeling a Turbine Generator**

>> In this activity, we will design a model of a water turbine.



Water bottle	Pinwheel	Plastic cup	Large bin
A		7	
	200	M.I	

- 1 Use the following materials to design a model of a water turbine.
- 2 Pour the water from the bottle onto the blades of the pinwheel.
- 3 When the water bottle runs out, use a plastic cup to refill it with the water in the jug to pour the water over the blades again.

## Observation;

- >> The blades rotate when water is poured over them.
- >> The blades stop when the water completely runs out.



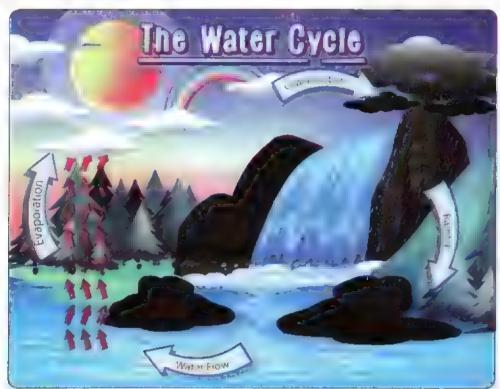
Moving water has kinetic energy that is used to run water turbines to generate hydroelectricity.





## Water Cycle

- >> The river's water does not return to its source, but it flows into other bodies of water.
- >>> Water evaporates and then condenses into clouds.
- >> When rain falls from these clouds, the water returns to the river.



- لا تعود مياه النهر إلى منبعها، ولكن يتدفَّق الماء إلى المسطحات المائية الأخرى.
  - بتيخُر الماء ويتكثّف بعد ذلك في شكل شُخُب.
  - » عندما يسقط اللطر من هذه الشُّحُب يعود الله مرة أخرى إلى النهر.

## Check your understanding?

>>> Put (√) or (X)		Put		or	(X)	):
--------------------	--	-----	--	----	-----	----

Water is a renewable resource of energy.

- n the water cycle, water condensates and then evaporates. (
- The blades of water turbines rotate by kinetic energy of wind.
- Wind turbines can be used to generate hydroelectricity.



### Activity 8 Record Evidence Like a Scientist Windmills and Watermills

>> In this concept, you have learned a lot about renewable and nonrenewable energy resources and the benefits of using renewable energy resources.



>> What are the different ways to use renewable energy resources to generate electricity?

My Clo	:mic			
NAME AND A STATE OF S	- МПИ: Н: <b>ЖІ</b> МІННАННЯВНЯ —С УЕМ ВІВВЧИ: ЛИССІС ПІТ	ng aparingsini stami si matauramananan ina manda si arbb	dddirwriadd bedlef dle-ledioledgod lawrana lawr llawr	ama nine minemprover year selblide. Militel-hilled
m harte he a che a che	MALES WAS STREET WITH STREET S	# 35 Nov 34465 11406 * 6+5 13331 - 40 35	gampa masampa masama mfamadamadan addid d	and color and also be less than the second of the second o
<b>Eviden</b>	nce:			
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Scient	ific Explanation	on with Rea	soning:	
Date on section of chart	is didn't species de de "Alls benedit specifies in the 1989es".	effet libe quaranter - li man e , s	MARINE MARIN - TOPOZIONA, MATERIAR THE THREE MARINES CAME HAVE	MARKETE MARKETERI-TO (PROCESSORS)-HERRESONS SORRESONS SORRESONS

### n Lessons 3 and 4 Exercises

	on F				
Choose the c	orrect answer	ie 4			
@ are use	d to increase the	potential energy o	f water.		
a. Watermills		b. Generators			
c. Dams		d. Greenhouses	;		
Aydroelectric p	ower is produce	d using			
a. air	b. water	c. soil	d. plants	5	
Water of rivers	stores great	energy at the to	op of wate	rfalls.	
a. kinetic	b. potential	c. electrical	d. light		
When the wate	r of rivers falls fr	om a high slope,	145 ADDRESS MENOCASS . #		
a. potential en	ergy is converted	d into kinetic energy	1		
b. kinetic energ	gy is converted in	nto potential energy			
c. potential ene	ergy is converted	l into electrical ener	gy		
d. kinetic energ	y is converted in	nto electrical energy	1		
The power soul	rce for the electri	c fan is .			
a. wind	b. water	c. heat	d. electri	city	
Without the	water of riv	ers can't be renewe	d.		
a. turbines	b. Sun	c. moon	d. wind		
Put $(\checkmark)$ or $(x)$ :					
When water be	comes free, pote	ential energy is char	nged into		
kinetic energy.				(	)
The flow of wat	er in dams can b	e controlled to gen	erate		
electricity.				(	)
Electricity gene	rated from water	r is called hydroeled	tricity.	(	)
Rivers store kin	etic energy.			(	)

	-○ <b>E</b>	nergy and Fuel		
	5	The electricity prod	duced by water is known o	s electromagnetic
		energy.		( )
	6	When water falls do	own on waterfalls, its kinetic	energy decreases. ( )
k		Write the scienti	fic term:	
	1	The device in an e	electric power station that	turns kinetic energy into
		electrical energy.		413 + 6 m/r commission flat of Early co-600 and 400 at 2012 consistency and co
q	2	A structure on the	river that controls the flo	w of water and increases
		the potential energ	y of water.	(
Q.	3	A type of electrical	energy generated by wat	ter turbines in dams.
				(1815) 1 4- Hyperen max management Skeller School Skeller
4		Complete the foll	owing using the words	between the brackets:
		(condenses -	Wind turbines - evaporate	s - kinetic energy -
			water turbines - wires	)
	Î	The input energy of	of a generator is	rereached b
	2	are p	laced in windy areas, whe	reare found
		on rivers.		
	3	Electricity is transfe	erred to cities through	to light cities.
	4	In water cycle, w		e heat of the Sun, then it
		befor	re falling as rain.	
		Complete the fo	llowing table:	
		P.O.C	Wind Turbines	Water Turbines
		Location	and pulsable and any pulsable date on a construction on a set a construction or graph on the first and a construction of the c	тау правиципп алалитын э тигина <b>лизана</b> аштана это об <del>бого добо об об об об об об об об об об об об </del>
	Fa. B. Salania	Similarities	SEE COMMISSION OF THE SECTION OF THE	Alanamatana ara - arana-penya ar-arana-penya - Alanamatana

### 6

### Study the following figures, then answer the questions below:

I) The following figure represents a waterfall.



- b. When the water falls, \_\_\_\_\_ energy is converted into energy.
- a. This figure represents \_\_\_\_\_\_.
  - b. It controls the flow of water, when it increases the \_\_\_\_\_ energy of water.
  - c. When water falls on turbines, they rotate to make \_\_\_\_\_ run and generate



### 7

### What happens if?

shim municipalities . westmer [

- Dams hold back the flow of water?
- The water of dams becomes free?
- Give a reason for:
  - Dams are built on rivers.

## EXCENS on Concept 3.3

Control of the Contro	
Managhan to Emiration	
Education and the second second	

	Marie Chara
Question 🕕	
400 00	

	(A) Choose the	correct answer	rı		
	1 All the followin	g are considered i	renewable resourc	es of energy, exce	ept
	pe per un manual de la companya de l				
	a. wind	b. coal	c. the Sun	<b>d</b> . water	
	2 Modern turbin	nes are tho	an old windmills.		
	a. longer	b. shorter	c. heavier	d. slower	
Ì	The power so	urce for the electr	ic fan is		
	a. wind	<b>b.</b> water	c. heat	d. electricity	
	Hydroelectric	power is produce	dusing		
	a. air	<b>b.</b> water	c. soil	d. plants	
	(B) Write the s	cientific term:			
	A structure on th	e river that contro	ls the flow of wate	er and increases t	the
	potential energy	of water.			)
	tuestion (2)				
	(A) Put (√) or (	(X):			
			number of small s	olar panels. (	)
	Both modern	wind turbines an	d old windmills a	re used to gener	ate
	electricity.			(	)
	3 When the kin	etic energy of th	e wind increases,	the windmill blace	des
	spin faster.			(	)
	Windmills car	n do their job all the	e time, as the wind	never stops blowi	ng
				(	)
	(B) Give a reas	on for: You feel t	he warmth of the	Sun at night.	
C	uestion (3)				
-					

### The opposite figure represents a panel of black pipes:



### Mulification 2

The Zilon (1)				
(A) Choose the co	rrect answer	•		
Both modern wir	nd turbines and	old windmills are s	similar in their	
a. blades numbe	er b. height	c. ways of workin	g d. blades sha	pe
2 The electricity for	rom wind turb	ines is transmitted	d into houses a	no
factories through				
a. the wind	b. devices	c. generators	d. wires	
The difference in	temperature b	etween cold and h	ot air causes	h. mar
a. rain	b. a shadow	c. wind blowing	d. a rainbow	
Dams control the	e water flow and	d increase Its	energy.	
a. potential	b. electric	c. magnetic	d. thermal	
(B) Write the scie	ntific term:			
A device that consis	ts of black pipe	s used to heat wat	ter. (	)
uestion (2)				
(A) Put (/) or (X):				
1 The electricity pro	oduced by wate	er is known as elec	tromagnetic	
energy.			(	)
Solar panels can	be used in irrig	ation equipment.	(	)
Sun is responsible	e for the water	cycle.	(	)
We use solar ene	ergy to preserve	e food.	(	)
(B) What happens	if?			
Wind doesn't blow in	an area that c	ontains wind turbin	nes?	
westlern (2)				
uestion (3)				

### Choose from column (A) what suits it in column (B):

(A)	(8)
① Greenhouses	a. are used in heating water.
Concave mirrors	b. are used in planting some kinds of crops.
Panels of black pipes	c. are used in cooking food.

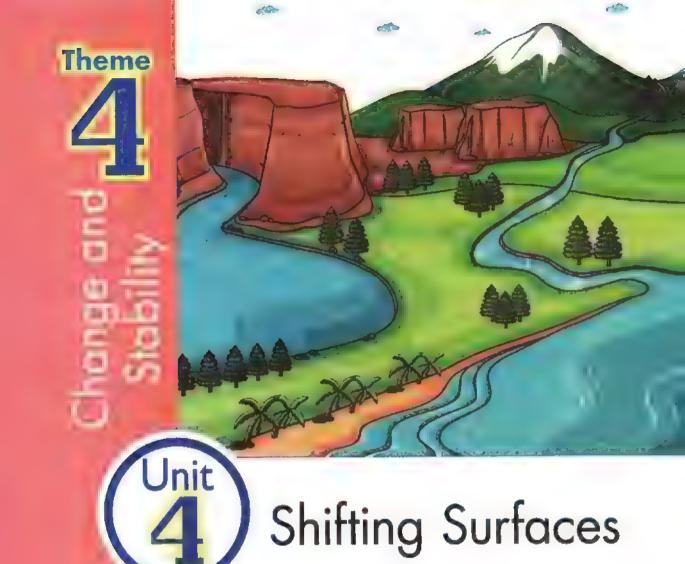
### School Book

# Assess Your Learning on Unit 3

Choose the correct answer:					
1) Energy doesn't destroy nor create	from nothing; this indicates				
a. the draining of energy resources					
b. the conservation and transform	nation of energy				
c. resources of energy are numero	ous				
d. destroying the energy resource	es				
2 The energy produced by radio that	t reflects its main function is				
a. electric energy	b. sound energy				
c. light energy	d. chemical energy				
The design and work of the robot	t that explores the surface of Mars				
depend on the idea of transforming					
a. electric into kinetic energy					
c. light into electric energy					
In our daily lives, we use devices the	hat depend on energy. Which of the				
following uses is true?					
a. A computer depends on kinetic					
b. A ceiling fan depends on electr					
c. The function of television deper	al and kinetic energy for operation.				
Which of the following energy form	b. Light energy				
a. Thermal energy c. Kinetic energy	d. Radiation energy				
Which of the following is a prefe					
clean energy?	inca hatara resource to generate				
a. Ocean and river water	b. Trees and dry herbs				
c. Water, coal, and oil	The state of the s				
are used in converting light					
a. Wind turbines b. Water turbine					
is a renewable source of e	·				
	s c. Water d. Fossil fuel				
	ater from waterfalls and dams and				
turbines is called energy.					
a. mechanical b. hydroelectric	c. potential d. thermal				

### Rearrange the following steps to describe how coal is formed: (\_\_\_\_) The Earth's surface plants get old and die. (\_\_\_\_) The remains of the plants were decomposed and covered with sand and clay layers. (\_\_\_\_) Anciently, Earth was containing with swamps where plants grew. d (\_\_\_\_) Several layers of clay and sand were deposited on the remains of died plants. (\_\_\_\_) The buried plants were changed into coal due to the effects of heat and pressure. Complete the following model: produces electric lamp Complete the following model to describe the hydroelectric energy, then determine the inputs and outputs of this system. Potential energy of the waterfalls Kinetic energy - Inputs:

- Outputs: .....



### Unit Concepts:

**Breaking Down and Moving** Rocks

Concept (2) Changing Landscapes

Unit Project Forces that Shape the Earth

### Unit Objectives

In this unit, we will study:

- 1 Factors that shape the Earth's surface, such as weathering, erosion, and deposition that occur over time.
- 2 The role of wind and water in changing the Earth's features.

### **Get Started** What I Already Know



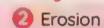
### How the Earth's surface changes



>> The Earth's surface is always changing.

Many factors can break down or change the Earth's surface, such as:







>> Many of Earth's landforms take millions of years to form, and we are going to study the story of each one.

Canyon



Sand Dunes



Valleu



Delta



### Wadi Nakhr:

- The image shown is of a canyon called Wadi Nakhr in the country of Oman. Have you ever seen a canyon?
- In your opinion, what could cause the different landforms shown in the photo?
- The wavy cliff sides and high peaks are clues to help us understand how this canuon was formed.





### Concept Objectives:

### By the end of this concept:

- Students can construct explanations based on observations of the roles water, wind, and heat play in weathering, erosion, and deposition.
- Students can make observations and collect data to provide evidence that mechanical and chemical weathering cause changes on Earth's surface over time, even in systems that appear to be stable.

### Key Vocabulary

- Air
- Water
- Weathering
- Chemical weathering
- Mechanical weathering
- Deposition
- Erosion
- Heat
- Sediment
- Soil

# Concept 1

### **Breaking Down and Moving Rocks**

	Lesson 1
Activity 1	Can You Explain?
Activity 2	Disappearing Sandcastles
Activity 3	Sandcastles, Rocks, and Canyons
C	Lesson 2
Activity 4	What Do You Already Know About Breaking Down and Moving Rocks?
Activity 5	What Is Weathering?
Activity 6	Types of Weathering
·	Lesson 3
Activity 7	Hands-on Investigation: Modeling Mechanical and Chemical Weathering
Activity 8	Weathering
Till	Lesson 4
Activity 9	Erosion
Activity 10	Deposition
<b>(</b>	Lesson 5
Activity 11	Evidence of Change
Activity 12	Record Evidence Like a Scientist: Disappearing Sandcastles

## Lesson 1



The Earth's surface is always changing due to the effects of wind, water, and weather changes.

· تتفيُّر مظاهر سطح الأرض باستمرار؛ بسبب العديد من العوامل مثل: الرياح، والماء، وعوامل الطقس.

### For Example:

Wind can break down rocks and move small particles of rocks from one place to another.

مكن للرياح أن تُفتَّت الصخور وتنقل جزيئات الصخور الصغيرة من مكان إلى آخر.



water can break down rocks and change the shapes of rocks.

• يمكن للمياه أن تُسبُّب تفتيت الصخور وتغيير شكلها.





### Check your understanding?

- Correct the underlined words:
  - The Earth's surface is stable as time passes.
- ( ----- )
- Wind and water can change the moon's surface.
- )) Give a reason for:
  - The Earth's surface is always changing.



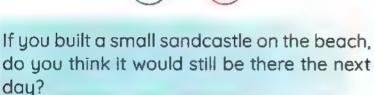


### Activity 2 Disappearing Sandcastles

If you walked on the sand of the beach dunes, would your footprints remain the next day?















### **Examples of Erosion**

### Sandcastles Erosion:

- Water waves break sandcastles down. after few hours.
- Water waves can move sand particles to other places.

### **Beach Erosion**:

• The movement of the waves causes erosion of the beach over time.





### MOTES

- Sand particles are formed from the breaking down of rocks.
- Wind and water can transport sand particles from one place to another.

### - ctivity



### Sandcastles, Rocks, and Canyons

We have learned that wind, water, and weather changes can change the Earth's surface.

### Earth's surface is changing by two ways:

### Hand Change

- Some changes to the Earth's surface happen so quickly, such as:
- The disappearing of sandcastle after few minutes when water waves hit it.

### Some changes to the Earth's surface

happen very slowly, such as:

 A little change may happen in the shape of coastal rock after many years because some parts of the rock break off.



بعض التغيرات لسطح الأرض تحدث بصورة سريعة مثل اختفاء
 القلعة الرملية بعد دقائق من اصطدام الأمواج بها.



 بعض التغيرات لسطح الأرض تعدث بصورة بطيئة جدًا مثل تغير بسيط في شكل الصغور الساحلية؛ بسبب تكسح بعض الأجزاء في الصغور.

### Similarities between sandcastles and coastal rocks:

- Both have steep needle-like parts and sloping sides at the bottom.
- . They are formed by the effect of water and wind.

أوجه التشابه بين القلاع الرملية والصحور الساحلية:

- · يحتوي كلاهما على أجزاء حادة تشبه الإبر وجوانب ماثلة في الأسفل.
  - يتشكُّلان بقعل الماء والرياح.

### Canyons

They are deep valleys carved by the flowing water.



### Shape:

• The canyon has steep needle-like parts and slopes at the sides

### Time of Formation:

· The canyon takes many years to be formed.

### Way of Formation:

• The canyon is formed by the effect of water.

- الشكل: يحتوي كلاهما على أجزاء حادة تشبه الإبر ومنحدرات على الجانبين.
  - ه الوقت اللازم لتكوُّنه؛ يستغرق تكوين الأخدود العديد من السنين.
    - مطريقه تكونه: يتشكل الأخدود بفعل المياه.

### Check your understanding?

- >>> Put ( 
  ) or ( 
  ):
  - Canyons have slopes at the bottom and steep needle-like parts.( )
  - Sandcastle becomes less stable after collision with the water waves.
  - The shape of the canyon was formed in a very short time. ( )
  - Canyons are carved by the flowing water. ( )

# Exercises on Lesson 1

	Choose the corre	ct answer:		
	①can change	the features o	f the Earth's surfo	ice.
	a. Water b	. Wind	c. Weather	d. All the previous
	All the following are	landscapes t	hat have change	d over a long time,
	except			
	a. canyons b	. sandcastles	c. coastal rocks	d. mountains
	Which of the following	ng shapes ma	ıy disappear quicl	kly?
	a. Canyons		b. Footprints on s	sand
	c. Coastal rocks on	the beach	d. Mountains	
	Sandcastles may be			
	a. water b	. wind	c. gravity	d. a and b
	Sandcastles will			
	a. still the same		b. become strong	ger
	c. disappear comp	letely	d. partially affect	ted
	Steep valleys forme	ed due to flowi	ng water erosion	are called
	a. hills b	sand dunes	c. canyons	d. deltas
	A canyon may take	to be	formed.	
	a. minutes b	. hours	c. days	<b>d.</b> years
R.	Put (✓) or (X):			
-	If we walk along a	sand dune ou	r footprints will re	main there the next
	day.	sana done, oo	, lootpillis wiii re	( )
		anuons is cons	sidered a rapid ch	nange of the Earth's
	surface.	angono lo com	station at tapia at	( )
í		reak rocks do	wn and change d	ifferent landscapes.
	Strong Willias Cart b	TOUR TOURS GO	m, and change d	( )

### Breaking Down and Moving Rocks o-

Sandcastles and coastal rocks face the same effect after of the same	collision w	ith
waves.	(	)
Coastal rocks have sloping sides at the bottom.	(	)
The Earth's surface changes from time to time.	(	)
All changes to the Earth's surface take hundreds of years.	(	)
Canyons take millions of years to be formed.	(	
The Earth's surface never changes.	(	)
Water and wind are natural factors that cause the change i	n the Eart	h's
surface.	(	)
Write the scientific term:		
A natural factor by which canyons are curved.	(	)
They are deep valleys carved by the flowing water.		)
Correct the underlined words:		
The Earth's surface is <b>stable</b> as time passes.		
Gravity can change the shape of canyons.	C	_)
The sandcastle becomes stronger after being hit by waves	<b>&gt;.</b>	
	de com el delega <del>militaring institut</del> e als espágnas <del>mili</del>	)
The shape of the canyon was formed in a very short time.	Red of Market Administration of a control of Application of the Control of Application of the Control of Application of the Control of the Co	)
Complete the following using the words between the	brackets	3:
(quickly - Coastal rocks - Wind - very slowly - steep - v	vater -	
canyons – sandcastle)		
1) The canyon has parts.		
Sandcastles' shapes change, while canyo	ons' shap	es
change		П
and can change the Earth's	andscape	es.
and have sloping sides at the	bottom.	

### Shifting Surfaces

### Choose from column (A) what suits it in column (B):

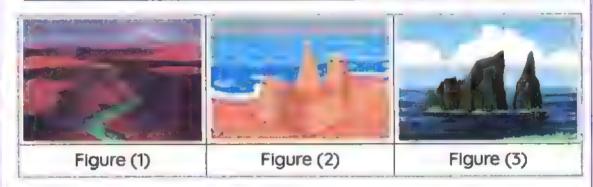
Column (A)	Column (B)
1 The sandcastle's	a. can be changed very slowly by the effects of
shape	water or wind.
2 The coastal	b. can be changed quickly by the effects of wind
rock's shape	or water.
	c. can be changed very slowly by the effect of water only.







### Study the following figures, then complete the following sentences:



- Figure (.....) has steep parts and sloping sides.
- Figures (\_\_\_\_) and (\_\_\_\_) are changed very slowly, while figure (\_\_\_\_) is changed very quickly.
- After many hours, figure (\_\_\_\_) will disappear completely.

### Give reasons for:

The Earth's surface is always changing.

### Breaking Down and Moving Rocks o

fter

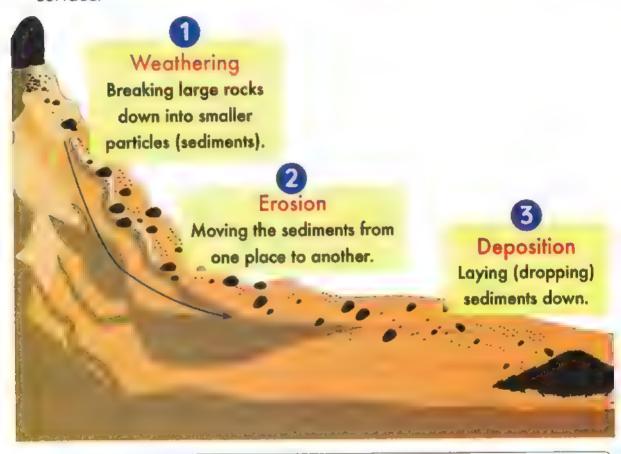




What Do You Already Know About Breaking Down and Moving Rocks?

### **Shaping the Earth**

>> There are three main processes that may cause changes to the Earth's surface.



يوجد ثلاث عمليات رئيسية قد تتسبُّب في تغيج مظاهر سطح الأرض:

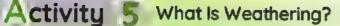
2 عملية التعربة: نقل فتات الصخور أو التربة.

[] عملية التحوية: تكسير وتعتبت الصخور،

(3) عملية الترسيب: إرساء الرواسب في الأسفل.







- >> What is the weather outside today? Is it sunny or rainy, windy or icy?
- All these factors are part of the weather and are also involved in weathering.
- · Weather and weathering are different where,



### a/eather

 Is the condition of the atmosphere at specific place.

الطقس: هو حالة الجو في مكان معين.

 Is the process of breaking down rocks into small (tiny) particles.

التحوية: هي معلية تفتُّت الصحّور إلى قطّع صفيرة،

### Weathering may cause

A breakdown (crumbling) of status.



Paint to peel on a building.



Waves to pull sand from the beach.



- Weathering breaks down big rocks into tiny rocks, then into pebbles or sand grains.
- Knowing the weather helps you decide what to wear when you go outside. تعمل التموية على تفتيت الصخور الكبيرة إلى صخور صغيرة ثم إلى حصى أو حبيبات رمل.

يشاعدنا معرفة حالة الطقس على تقرير ما سنقوم بارتدائه خارجًا.



### Check your understanding?

>>> Put ( \( \sigma \)) or ( \( \sigma \)):

Weathering can change the shape of landscapes over time. (

Weathering is the condition of the atmosphere in a specific place.

### Shifting Surfaces





### Activity 6 Types of Weathering



>> If you have seen rocks of different sizes, this is evidence of weathering.

**Enormous rocks** (that makes up mountains

are broken boulders down into

are broken down into

smaller rocks

down into

- · تُعتبر التجوية من العمليات التي تُغيّر سطح الأرض.
- إذا رأيت صخورًا ذات أحجام مختلفة؛ فهذا دليل على عملية التجوية.
- · تتسبُّب التجوية في تكسُّر الصخور الكبيرة (الْكوُّنة للجبال) إلى صخور أصغر إلى أن تصبح رمالًا.

### lipes of Weathering





The process of breaking rocks down with a change in their structure (nature) due to chemical reactions.

عملية تفتّت الصخور مع تغيير تركيبها بسبب التفاعلات الكيميائية.



The process of breaking rocks down without a change in their structure (nature) due to physical factors.

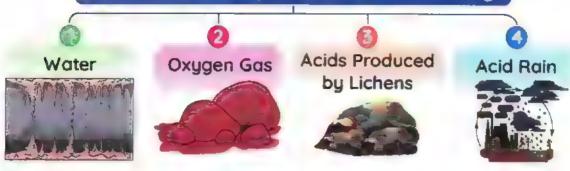
عملية تفتت الصخور بدون تغيير تركيبها بسبب العوامل القيز بائبة.



It is the change in the structure of rocks due to chemical reactions.

التجوية الكيميائية هي التغير الذي يحدث لتركيب الصخور بسبب التفاعلات الكيميائية.

### Reasons (Factors) of Chemical Weathering





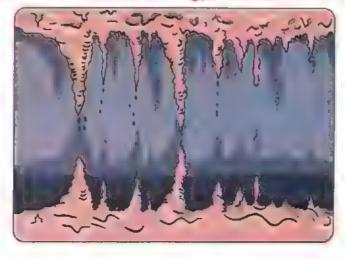
### Water:

### As water runs over rocks:

- It dissolves some minerals in rocks. This makes the rocks fall apart.
- Dissolved minerals combine again to form new shapes, as in a limestone cave.

### يتسبُّب جريان لنياه على الصخور في:

- ذو بان يعض العادن الْكَوِّنة لهذه الصخور؛ مما يؤدي إلى تأكل هذه الصخور،
- قد تتحد أجزاء الصخور الذابة مع مواد أخرى: لتُكوّن أشكالًا جديدة كما في الحجر الجيرى الموجود في هذا الكهف.
- Most caves are formed due to this type of chemical weathering.





### Oxygen Gas:

 Oxygen in the air reacts with iron in some rocks forming red-colored rust.



This reaction also weakens rocks, causing them to break more easily.

- يتفاعل الأكسحين الموجود في الهواء مع الحديد المُكوُّن ليعض الصخور مُكوِّنًا صدأ أحمر اللون.
  - يتسبُّب هذا التفاعل في إضعاف تماسك الصخور. وتَفتُّتها بسهولة.

### Acids Produced by Lichens:

- Lichens are tiny plant-like organisms that produce acids on rocks as they grow.
- Over time, acids dissolve minerals found in these rocks,
   and break them down easily.
  - الأشنات: هي كانتات دقيقة تشبه النباتات، تنتج أحماضًا على الصخور أثناء نموها.
  - بمرور الوقت تعمل الأحماض على إذابة المعادن المكونة للصخور؛ مما يتسبُّب في تكسير الصخور.

### Acid Rain:

 Acid rain can also dissolve minerals found in these rocks, causing the breakdown of rocks.

 عمكن للأمطار الحمضية أيضًا أن تُسبّب إذابة المعادن المُكوّنة للصخور؛ مما يتسبب في تكسير الصخور.



### Medicinal Attaches

It is the breaking down of rocks due to the effect of physical factors.

التجوية الميكانيكية: هي عملية تفتت الصخور بسبب تأثير العوامل الفيزيائية.

## Reasons for Mechanical Weathering

Temperature

Wind and Sand

Flowing Water

**Plant Roots** 

### Temperature:

Water and temperature often work together to break rocks.



Water flows into the tiny cracks in the rocks.

12

When the temperature is very cold, water freezes and expands, so the cracks become wider.



When temperature increases, ice melts, and water fills the newly formed cracks again.



The cycle of melting and freezing continues until rocks are broken down.









- [] يتسلُّ الماء ويتغلغل داخل شقوق الصحور الدقيقة.
- 2 عند انخفاض درجة المرارة يتجمَّد الماء ويتمدد داخل الشقوق؛ مما يتسبب في اتساع هذه الشقوق أكثر.
  - عند ارتفاع درجة الحرارة ينصهر الثاج وتملأ المياه الشقوق الجديدة التي تكونت.
    - 🖪 تستمر دورة الانصهار والتجمُّد إلى أن تنكسر الصخور،

### - Shifting Surfaces

### Wind and Sand:

- Sand and wind team up to wear down large rocks.
  - 1 Wind rushes sand on the rock surface.
  - 2 Friction occurs between sand and rocks.
  - 3 This causes the smoothing of rocks and breaks them down.



### NOT

 Friction between sand and rocks is like the force of sandpaper on a piece of wood.

- تتسبِّب الرمال والرياح في تأكل الصخور الضخمة.
- 🚹 تقوم الرياح بدفع الرمال على أسطح الصخور. 🏿 تحدث قوة احتكاك بين الرمال والصخور.
  - 🛐 تتسبب تلك القوة في صقل الصخور وتفتتها بعد ذلك.
- · ملحوظة: قوة الاحتكاك من الرمال والصخور مثل قوة استخدام ورق الصنفرة على قطعة الخشب.

### Flowing Water:

 Flowing water, full of small bits of floating gravel and sand, scours the rough edges of boulders.



 Rushing water causes rocks to tumble over one another, breaking off larger pieces when collisions occur.

### المياه المندفعة والجارية::

- تمتلئ المياه الجارية بقِطع صغيرة من الحصى والرمل المجرف التي تصقل تلك القِطع صغيرة الحواف الخشعة للصخور.
- تتسبب المياه المندفعة في تراكم الصخور واحدة فوق الأحرى؛ مما يتسبب في تكثّر قطع الصخور الكبيرة عند ارتظامها معًا.

### Plant Roots:

- Plant roots grow inside the cracks of rocks.
- 2 Cracks become wider.
- 3 Rocks are broken down.



### جذور الأشجار:

1 تنمو جدور العباتات في شقوق الصخور. 2 يتسبِّب ذلك في اتساع الشقوق. 3 تتعتُّت الصخور.



1360 Science Prim. 4 - Second Term

>>> We can see the effects of weathering all around us in the little rocks, pebbles, and sand that were parts of much larger structures.

### Give a reason for...

- It is hard to see weathering in action.

Because weathering happens over long periods of time.

(hot	Chemical in bullianing.	
Definition	The process of breaking rocks down with a change in their structure (nature) due to chemical reactions  بعطية تفنّت الصخور مع تغيير تركيبها بسبب التفاعلات الكيميائية.	The process of breaking rocks down without a change in their structure (nature) due to physical factors.  معلية تفتُّت الصخور بدون تغيير تركيبها بسبب العوامل الفيزيائية.
Reason (Factors)	<ol> <li>Water</li> <li>Oxygen gas</li> <li>Acids produced by lichens</li> <li>Acid rain</li> </ol>	<ul><li>1 Temperature</li><li>2 Wind and sand</li><li>3 Flowing water</li><li>4 Plant roots</li></ul>

### Check your understanding?

Classify these situations by writing the letters (M) for me	echina	cal
weathering and (C) for chemical weathering:		
Water freezes inside the cracks in rocks.	(	)
2 Water dissolves minerals in limestone caves.	(	)
Rushing water causes the smoothing of rocks.	(	)
Plant roots grow into the cracks of rocks.	(	)
5 Formation of red-colored rust.	(	)

# Exercises on Lesson 2

### Choose the correct answer: weathering is the change in structure of a rock. a. Physical b. Chemical c. Mechanical d. Electrical a. melting b. weathering c. erosion d. deposition Weathering changes the mountains in the following order: a. Small rocks --- boulders --- then sand b. Sand --- small rocks --- boulders c. Boulders --- small rocks --- sand d. Sand boulders small rocks Oxugen can rust ................ a a glass b. paper c. a rock d. plastic Plant \_\_\_\_\_ play an important role in the mechanical weathering process. a. leaves b. stems c. roots d. flowers 6 All of the following are reasons for chemical weathering, except \_\_\_\_ a. water b. plant roots c. acid rain d. oxygen gas may cause chemical or mechanical weathering. a. Lichens b. Oxygen c. Water d. Plant's roots 8 \_\_\_\_\_ produce acids as they grow on rocks. a. Insects b. Plant roots c. Beetles d. Lichens 9 Which of the following examples represents mechanical weathering? a. Red-colored rust on rocks. Acid rain falls on rocks. c. Roots grow inside rocks.d. Water dissolves minerals. 10 \_\_\_\_ and \_\_\_\_ cause chemical weathering. a. Lichens – plant rootsb. Acid rain – oxygen

c. Melting – freezingd. Sand – wind

	Sand is formed due to the breaking down of				
		a. glass b. plastic	c. glass d. rocks		
Q.	12	Limestone caves are formed due t	to the combination of	s 4	
		a. dissolved minerals	<b>b.</b> insoluble minerals		
		c. red-colored rust	d. acid rains		
1	13	is the process in which	sediments are carried to a	noth	ner
		place.			
		a. Deposition b. Erosion	c. Weathering d. Meiting		
		Dissolving minerals from rocks to r	ecombine with new substance	s is	an
		example of			
ī		a. mechanical weathering	b. weathering by wind		
ı		c. chemical weathering	c. erosion		
	15	All the following are processes tha	t change the Earth's surface, e	exce	ept
H		BB-00000-0110-01101-0110-0110-0110-0110			
i		a. erosion b. digestion	c. weathering d. deposition		
	10	Lichens produce that dis	ssolve(s) minerals found in roc	ks.	
		a. oxygen b. rains	<b>c.</b> water <b>d.</b> acids		
	17	All of these are types of sediments	s, except		
i		a. pebbles b. sand grains	c. lichens d. rocks fragn	nen	ts
	1	2.4//2/			
J	7	Put (✓) or (X):	- t t t	_	_
		The deposition process takes place	·	(	)
		We can see weathering in action e	-	(	)
	-	Weathering is the condition of the		(	)
		Living organisms may cause mech	nanical and chemical weatheri	ng.	
	_			(	)
	_	Acid rain has the same effect on ro	•	(	)
		Melting and freezing change the vo	olume of water in a rock's crack	(S a	nd
		make them wider.		(	)

	Shifting Surfaces			
	The broken down statues are evidence of the deposition p	rocess		
			(	)
	Plant roots help in the formation of rocks.		(	)
T	Rocks become stronger when iron found in them rusts.		(	)
T	Wind is one of the agents that cause weathering.		(	)
	1 Weathering may occur due to collision (friction) between	n rocks	ar	nd
	sand carried by wind.		(	)
1	Correct the underlined words:			
	The shaping of the Earth's surface begins with erosion pro	cess.		
	(Marein	etsm <b>animmen</b> jaset (1886		)
	When oxygen reacts with the iron in rocks, a green-col	lored r	ust	is
	formed. (	- <u>L-reiss-brook, room</u> gelens-		)
	Stems of plants grow inside cracks of rocks, causing the	em to b	ore	ak
	·	***************************************		-
	Carbon dioxide in the air always causes rust on rocks. (		urddirlalalirus s sa	)
	Limestone caves were formed due to mechanical weather			,
	As plant roots grow inside rocks, the cracks become narro	or	P 5 40-84 4-0 10 F F4	.)
Ì		wei.		)
ij	The origin of sand is the breaking down of glass.	and man water a section	M4464 107 111	.)
				ĺ
3	Complete the following using the words between the	brack	ket	<u>s:</u>
I	(Mechanical - Acid rain - chemical - oxygen - Acid	s -		
	iron - plant roots)			
	The melting and freezing cycle has the same effect as	, as	the	ey
ı	make the cracks in rock become wider.			
	produced by lichens may dissolve rocks.			
	has the same effect of lichens on rocks.			
	weathering and weathering are types of	weath	erin	ıg.
	When the in air reacts with in rocks,			
	a red-colored rust is formed.			

	0	
Write the scientific term:		
The process of moving rocks from one place	to another.	
	( )	)
The process of breaking boulders down into	smaller rock part	icles.
		)
The process of laying sediments down.	\$250. West-West-West-West-West-West-West-West-	)
The kind of weathering that takes place by the	e effect water and	
temperature.	**************************************	)
The kind of weathering that changes the stru	ecture and color of	rock.
	County time as commences as a southern heart has a market man as	)
They are tiny, like plants, that live on rocks an	d produce acid on t	hem.
	$y_1,y_2\in (v_1v_2), v_3) \leq (v_1v_2) + (v_2v_3) + (v_3v_3) + (v_3v$	·)
The gas that causes the red-colored rust on se		
	( MEMORPHEMORIA-) - (CONTRACTOR OF CONTRACTOR	
A part of the plant that breaks down rocks as:		
	(1) and (1) an	
A type of caves formed due to combination		
rocks.	*** 10.2 ************************************	
A mineral in rocks that reacts with oxygen for	orming rea-colorea	rust.

### Choose from column (A) what suits it in column (B):

Column (A)	Column (B)		
1 Lichens	a. causes mechanical weathering for rocks.		
Water	b. causes the red-colored rust on a toy car.		
Oxygen c. produce acids as they grow.			
Melting and freezing d. may cause both types of weathering.			

and water fills the neezes, expands, and water fills the neezes, expands, and water fills the neezes, expands, and water fills the way into rock constitutions by writers (C) for charging	ridens the cracks. continues. racks.						
g and freezing cycle Is its way into rock c situations by writ	e continues. racks.						
ls its way into rock c	racks.						
situations by writ							
	ina letters (M) for r						
d (C) for chamies		nechan					
id (C) for chemics	al weathering:						
v into the cracks of r	ocks.	(					
② Iron rust formed on a toy car.							
<ul> <li>Water freezes inside the cracks of rocks.</li> <li>Water dissolves the minerals in the limestone cave.</li> <li>Acid rain falls and breaks down the rocks.</li> <li>Oxygen reacts with iron in rocks, which weakens iron-rich rocks.</li> </ul>							
							(
					nd onto the rock surf	face.	(
					ns eat away the roc	ks where they grow.	(
	d on a toy car.  Inside the cracks of reside the cracks in the leads the common the leads and the leads are considered to the rock surfaces and the rock surfaces and the rock surfaces are away the rock surfaces.	d on a toy car.  Inside the cracks of rocks.  Is the minerals in the limestone cave.  Indicates down the rocks.					

- Figure (\_\_\_\_\_) represents a living organism that causes chemical weathering.
- Oxygen gas has a bad effect on rocks in figure (\_\_\_\_\_).

weathering.

Give reasons for:
Knowing the weather conditions is very important.
Weathering may appear on statues and buildings.
The rocks around us exist in different sizes.
Rust appears on some old toy cars.
Oxygen in the atmosphere has a bad effect on some rocks.
Lichens break down rocks as they grow.
Sometimes, sand has the same force as sandpaper on a piece of wood.
Plant roots are considered a physical factor of mechanical weathering.
What happens if?
A metal toy is left outside and exposed to air and rain?
Flowing water with gravel and sand collides with boulders?
Oxygen gas reacts with iron rocks forming a red-colored rust?
Acid rain falls on rocks?
Water runs through limestone caves?
Lichens grow on rocks produce acid?
Plant roots grow inside rocks?

## Lesson 3





Activity Mechanical and Chemical Weathering

### Experiment (2)



>> In this activity, students will investigate the similarities and differences between mechanical and chemical weathering.

• في هذا النشاط، سيقوم الطلاب بالتحقيق في أوجه النشاية والاحتلاف بين التجوية المكانيكية والكيميائية.

### Took

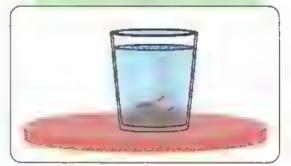
Two pleces of biscuits	Napkin	A cup of water	Antacid tablets
(3)			

A model of mechanical weathering



1 Crush a piece of biscuit with your hand on the napkin.

A model of chemical weathering



2 Place a piece of biscuit in the cup, then add water and antacid tablets to it.

# Concept

### **Observation**

- In the model of mechanical weathering, the biscuit is broken into small pieces, but it is still the same material.
- In the model of chemical weathering, a completely different new substance "dough" is formed.

### Conclusion

- Mechanical weathering breaks down rocks into smaller pieces without changing their structure.
- Chemical weathering breaks down rocks into smaller pieces, and changing their structure.

### Give a reason for...



- <u>Chemical weathering causes greater changes to substances than</u> mechanical weathering.

Because chemical weathering causes a completely new different matter, while mechanical weathering breaks the matter down into small pieces without changing it.

### 1

### Check your understanding?

### >>> Put ( ) or ( ):

- Scientists use models of weathering because it is hard to see weathering in action.
- The weathering process usually takes a few days to happen. ( )
- Mechanical weathering always produces a new substance. ( )
- Water may cause mechanical weathering or chemical weathering.

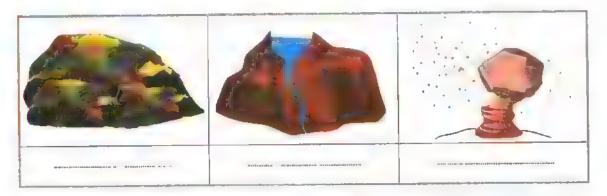
( )



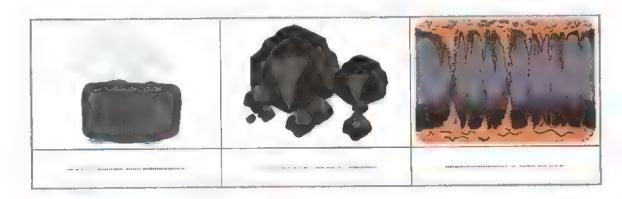
### Activity 8 Weathering

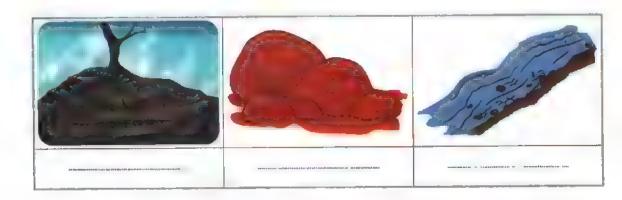


>>> Study the following figures, then classify them by writing letters (M) for mechanical weathering and (C) for chemical weathering:



192





# Exercises on Lesson 3

Choose	the	correct	answer:
	-		

9	Choose the correct answer	
•	Crushing a piece of ice into sm weathering.	all pieces is considered a model of
		c. mechanical d. electrical
2	is a model of chen	
Ī	a. Cutting vegetables to make	•
	b. Adding antiacid tablet and v	vater to a biscuit
	c. Breaking down a glass by a	hammer
	d. Dividing a loaf of bread by a	knife
1	All the following are properties	of chemical weathering, except that
	BEFFARE ST-FURTH-SILLEPIN-F-HIMPHINITER FT-FURTH-SILLEPIN-F-HIMPHINITER FT-FURTH-SILLEPIN-F	
	a. it changes the material of ra	ocks completely
	b. It keeps the material of rock	S
	c. it may dissolve rocks comple	etely
	d. it produces greater changes	to the rocks
	Which of the following changes	the matter of rocks?
	a. Roots grow in rocks.	
	b. Lichens produce acld on roc	ks.
	c. Strong wind	d. Heavy rain
•	The process of breaking down	rocks on the Earth's surface is called
	a. erosion b. weathering	c. decomposition d. deposition
	When acid rain falls on a building	ng, all the following may occur, except
	a. chemical weathering	b. a change in the paint color
	c. a change in its rocks structur	e <b>d.</b> mechanical weathering

— Shifting Surfaces		
Which process describes water getting into cracks, freezing, an	d	
breaking the rocks or apart?		
a. Erosion b. Chemical weathering		
c. Mechanical weathering d. Deposition		
Put (/) or (X):		
Chemical weathering causes greater changes than med	hani	ical
weathering.	(	)
Putting some nuts in a mixer is a model of chemical weathering.	(	)
Both mechanical and chemical weathering processes break do	own	the
rocks into smaller pieces.	(	)
Putting biscuits in water and adding an antacid tablet resemble	oles	the
effect of chemical weathering.	(	)
If a rock undergoes chemical weathering, its size and structu	ire s	tay
the same.	(	)
6 Chemical weathering changes the composition of the rocks.	(	)
Correct the underlined words:		
When a metal statue slowly turns green, is considered med	han	ical
weathering.		)
Weathering takes a short time in the real world.	10-77-1 207 207-11-1	)
Dividing a bar of chocolate into smaller pieces is a model of c	hem	iical
weathering.	ha- <del>nopropop</del> pena	)
Growing roots inside a rock, causing chemical weathering.		
		)
Complete the following using the words between the bra	ackı	ets:
(breaks down - mechanical - matter - Chemical - long - sho		
weathering changes the matter greater than		
weathering.		
Chemical weathering always changes the of rocks	>.	
— 1410 Science Prim. 4 - Second Term		

#### Breaking Down and Moving Rocks o-

3 Mechanical weathering always	rocks without changing its
matter.	
Weathering always takes a	time, but we can see its effects
on rocks.	
Write the scientific term:	
1 It is a type of weathering that occurs	s in rocks and leads to the
formation of a completely different i	material. ()
2 It is a type of weathering that break	ks rocks down without changing
their matter.	(17th - M. prediction on the
Give reasons for:	
Crushing a biscuit into small pieces is	a model of mechanical
weathering.	
**************************************	
Putting biscuits in water and adding of	an antacid tablet to it is a model
of chemical weathering.	
bal hald fall-server all electric server and e	майна айментання принципентуру энтернетического — — — — — — — — — — — — — — — — — —
Chemical weathering causes greater	changes to the rocks.
About half a list bill hilliam handers dieses (IBMH-SERES PER) 1888 (IBMH-SERES PER) 1888 (IBMH-SERES PER) 1888 (IBMH-SERES PER) 1889 (IBMH-SERES PER) 188	NHS, INCINCINCINCINC - III - MEDITREC - \ ININ-
What happens if?	
We crush a biscuit into small pleces?	
(Concerning the type of weathering of	and resulted material).
#980 P\$3984PPALAMAKAMAKA H. MERSHANIS HELITING HELITING HELITING HARVES	
We submerge some biscuits in hot te	a?
(Concerning the type of weathering of	
NIAL DISCONNESS PROPERTY CONTRACTOR IN CONTR	The second state of the second state of the second



# Lesson

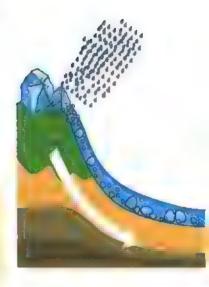


>> When rocks are weathered, they are broken down into smaller pieces, so these small pieces are ready for erosion.



It is the process of moving small particles of sand, soil, or rocks from one place to another.

عملية النَّفرية: هي العملية التي تحدث عند انتقال الجسيمات الصفيرة من الرمال أو الصخور أو التربة من مكان إلى آخر،





#### **Erosion by Gravity:**

 Gravity pulls broken rocks down a mountainside. تسحب الجاذبية الأرضية الصغور من جوانب الجبال إلى أسقل.

#### **Erosion by Wind:**

- The wind carries grains of sand from one place to another.
- A gentle wind moves grains of sand for a short distance (about meter).
- Stronger wind will blow more sand for a longer distance.
  - تحمل الرياح حبات الرمال من مكان لآخر.
  - تُحرُك الرياح الخفيفة الرمال لسافة قصيرة قد تكون مثرًا واحدًا.
  - تنفع الرياح الأقوى قدرًا أكبر من الرمال وتنقلها إلى مكان أبعد.





#### **Erosion by Water:**

Rivers and floods erode rocks and soil from their banks and carry them downstream.

 تعمل الأتهار عن تعرية الصخور والتربة عنى ضفافها و تحملها في اتحاه حريان النهر.

Sea waves pull sand away from beaches.

 تقوم الأمواج يسحب الرمال من الشواطع،

Rain washes the soil on farms that are located beside downhills.

> تجرف مياه الأمطار التربة الزراعية القريبة من المنحدرات الحبلية.







#### >> Sometimes you can see erosion happening, such as:

- During flash floods, hurricanes, or landslides.
- 2 You may see sediments carried down gutters by water runoff after a big rainstorm.
- The water in a nearby creek appears muddy.

#### قد تشاهد عملية التعرية أحيانًا من خلال:

- 🚹 الفيضانات المفاجئة أو الأعاصير أو الاتهيارات الأرضية. 🙍 انتقال الرواسب بفعل جريان المياه بعد عاصفة قوية ممطرة.
  - 🕃 تحوُّل المياه إلى مُظهر طيني أحيانًا في جدول (ممر ماتي) قريب.

They are pieces of weathered rocks that are moved by Sediments: 6 gravity, wind, and water.

الرواسب؛ هي قطِّع الصخور التي تفتَّت بسبب التجرية، ثم تحرَّكت من مكانها بفعل الجاذبية والياه والرياح.

#### Check your understanding?

- >>> Put ( / ) or ( / ):
  - Sometimes we can see erosion in action.

Water can play an important role in weathering and erosion.(



#### Activity 10 Deposition

Rocks can be broken into At the end, the sediments

smaller pieces through weathering.

> These pieces are carried away through erosion.

settled by deposition.

It the process of settling rocks and soil in a new place Deposition after they have moved by erosion...

الترسيب: هو عملية استقرار الرواسب في مكان جديد بعد تحرُّكها بفعل التعرية.

#### How does deposition occur?

- As the wind blows, it picks up sand, then tosses it ground in the gir.
- As the wind moves, sand travels with it.
- When the wind stops blowing, the sand falls to the ground and is deposited.



🗻 عندما تهب الرياح، فإنها تجمل الرمال ثم تقذفها في الهواء. 🙎 كلما تحركت الرياح تتحرك معها الرمال.

[3] عندما تتوقف الرياح عن الحركة تسقط حبات الرمال وتستقر (تترسُّب) على الأرض،

#### The role of deposition by water

- A river may deposit a sand bar along its banks.
- A river could carry sediment, and when the river meets the sea, sediments may be deposited.
- This forms a delta, such as the Nile Delta.



• يعمل النهر على ترسيب شريط من الرمال على طول ضفافه.

- · يمكن للنهر حمل الرواسي، وعندما يصب النهر في البحر تارسُّب بعض الرواسب التي يحملها النهر في قاع هذا البمر.
  - بذلك تتشكُّل الدلتا مثل دلتا نهر النيل.

#### Delta

It is a fan-shaped (triangle-shaped) that has a mass of mud and sediments formed when a running river enters a large water body (sea or ocean).

#### The role of deposition by wind

- Strong wind can form large sand dunes, such as:
  - Western Desert in Egypt
  - 2 Rub' Al Khali in Arabian Peninsula.
- Weak wind can form small sand dunes, such as: Small dunes on a beach.

#### Erosion and deposition are linked processes

1 If rocks become eroded, they must be deposited.

2 If you see a deposit of sand means it has already been eroded somewhere else.

# Lesson 5



#### Activity 11 Evidence of Change



>> Look at the three images shown and consider what you have learned about the processes of weathering, erosion, and decomposition.



Weathering is caused when wind or water break down the rocks and change the shape of the landform by mechanical or chemical processes.



Erosion is caused when wind or water move material from one place to another.

#### Deposition



Deposition occurs when eroded materials stop moving and settle on a surface, often forming layers over time.



### Activity 12 Record Evidence Like a Scientist: Disappearing Sandcastles

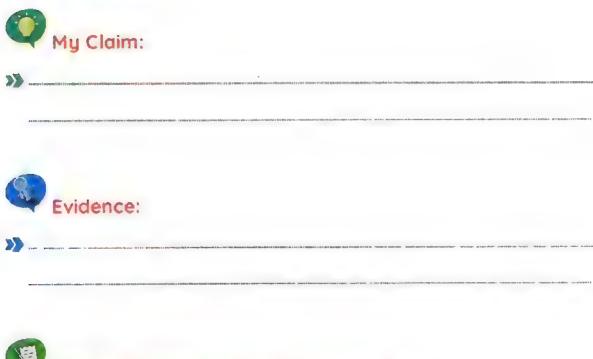
Disappearing Sandcastles

Now, you will use your new ideas about disappearing sandcastles to write a scientific explanation that answers the Can You Explain?





>> How do wind, water, and weather change the Earth's surface?





Scientific Explanation with Reasoning:

# Exercises on Lessons 4 and 5

Choose	e the co	rrect answer.				
***************************************	is the mo	ving of sand or	rocks to another	place.		
a. Wea	thering	b. Erosion	c. Deposition	d. Decomposition		
The for	ce of	pulls rocks f	rom the top of th	e mountain to		
its botto	om.					
a. river	water	b. seawater	c. rainwater	d. gravity		
со носинович	erode(s)	rocks and soil fi	rom their banks.			
a. Rive	rs	b. Waves	c. Rainwater	d. Gravity		
When o	river car	rying sediments	meets a sea,	is formed.		
a. cany	<b>j</b> on	b. sand dune	c. delta	d. snow		
	is a proce	ess of settling ro	ocks after moving	to a new place.		
a. Wea	thering	b. Erosion	c. Deposition	d. Evaporation		
<b>Weather</b>	Weathered rocks can be eroded by all the following factors, excep					
res allebras are may accompled to 64.						
a. grav	ity	b. water	c. sunlight	d. wind		
A gentle	e wind ca	n form				
a. a de	lta		b. small sand d	unes		
c. large	sand du	nes	d. a mountain			
1	occurs wl	hen eroded sedi	ments stop movi	ng and begin to build		
up.						
a. Depo	osition	b. Erosion	c. Weathering	d. Photosynthesis		
Wind co	an create	a hill of sand co	alled			
a. delta	נ	b. a canyon	c. a valley	d. a sand dune		
10 Gentle	wind can	carry sand grain	ns for dist	ance		
a. shor	t	b. long	c. huge	d. very long		
1						

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Put (/) or (X):		
The gravitational force can cause erosion of the	rocks. (	)
Sometimes you can see erosion happening.	(	)
As the wind becomes stronger, it carries the san	nd grains for a sho	rter
distance.	(	)
After weathering, small rock particles pile up ar	nd aren't moved fr	om
their place.	(	)
Sediments are deposited where they are eroded	and picked up. (	)
Blowing sand grains from one place to anoth	ner by wind is cal	lled
deposition.	(	)
A delta is a rectangular-shaped mass of sedimer	nt formed when a ri	ver
meets the sea.		)
Pulling sand from seashores by sea waves is cal	· ·	)
The deposition process never changes the shape	of the Earth's surfa	ice.
	(	)
The formation of sand dunes in the Eastern Des the movement of winds.	sert in Egypt is au	OTS
Floods are one of the factors that cause water e	racion	)
The erosion process is usually followed by the we		
The erosion process is osodily followed by the we	differing process.(	,
Write the scientific term:		
It is the process that occurs when soil is moved fi	rom one place to	
another.		)
It is an eroding factor that pulls the rocks down r		
It is an eroding factor that moves rocks from the		
It is the process that lays sand down when the w	find stone blowing	)
it is the process that lags saild down when the w	(	,
It is a landform of deposited sediments formed v		
a sea.	(	

_	Shifting Surfaces				
	Complete the	following using the	words between the brackets:		
1	(water - Nil	e Delta – hurricane -	deposition - gentle wind -		
		Egyptian western desert)			
Á	① A fo	rms a small sand du	ne, while a forms large		
	sand dunes like	that in			
	is a 1	fan-shaped mass of	mud and sediments.		
	Wind,	and gravity are n	atural factors that control erosion		
	process.				
	The process of	laying down of se	ediment after its erosion is called		
	Abbette 12 minutes minute statement and the 12 minutes and 12 minu				
	Choose from	column (A) what s	uits it in column (B):		
	Column (A)		Calling (D)		
	COIOIIII (A)		Column (B)		
	Rain	a. erodes rocks fro	m their banks downstream.		
		a. erodes rocks fro	m their banks downstream.		
	Rain		m their banks downstream. mountainsides.		
	Rain Gravity	b. pulls rocks down	m their banks downstream. mountainsides.		
,4	Rain Gravity Rivers	b. pulls rocks down c. washes soil in a	m their banks downstream.  mountainsides.  nilly farmland.		
A. Carrier and Car	Rain Gravity Rivers Mention the pr	b. pulls rocks down c. washes soil in a	m their banks downstream.  mountainsides.  hilly farmland.		
	Rain Gravity Rivers Mention the property	b. pulls rocks down c. washes soil in a cocess from these Veathering - Erosion	m their banks downstream.  mountainsides.  hilly farmland.  words:  Deposition)		
	Rain Gravity Rivers Mention the property	b. pulls rocks down c. washes soil in a	m their banks downstream.  mountainsides.  hilly farmland.		
	Rain Gravity Rivers Mention the property	b. pulls rocks down c. washes soil in a  rocess from these veathering - Erosion ase	m their banks downstream.  mountainsides.  hilly farmland.  words:  Deposition)		

The formation of sand dunes

Pulling sand from the beach

Hurricanes and floods

Formation of the delta

L	1
4	
8	

Give reasons for:
Gravity is one of the eroding factors.
The formation of sand dunes.
Erosion and deposition are linked processes.
What happens if?
Rain falls on hilly farmland?
The wind stops blowing? (Concerning the process happening to sand)
River water settles some sediments at the meeting point with the sea?
Add against the second

### Model Excens on Concept 4.1

uestion (1)	ModuliEx		
(A) Choose the	correct answer		
1) Steep valleys t	ormed due to flow	ving water erosion	are called
a. hills	b. sand dunes	c. canyons	<b>d</b> . deltas
2. All the followin	g are processes th	at change the Eart	h's surface, exce
a. erosion	b. digestion	c. weathering	d. deposition
A canyon may	take to be	e formed.	
a. minutes	<b>b.</b> hours	c. days	<b>d.</b> years
Plant process.	olay an important	t role in the mech	anical weatheri
a. leaves	b. stems	c. roots	d. flowers
<ul><li>The deposition</li><li>Pulling sand fr</li></ul>	process takes pla	nechanical weather ace before the eros sea waves is called the to time.	ion process. (
(B) Give a reaso	n for: Formation	of a red-rust layer	on some rocks
uestion (3)			
	_	the words between	
(expan	ds - rocks - Limes	tone caves – weat	hering)
		ing down of	
		ombination of disso	
		egins with the and its volume	·
(B) Write the se	riontific towns		

They are tiny plant-like organisms that produce acids on rocks as they

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grow.

### Medel-Exam 12

Question	ĺ	1
	u	

luestion (1)				
(A) Choose t	he correct answer	*		
All of the fol	lowing are reasons fo	or the chemical we	athering, except	
a. water	b. plant roots	c. acid rain	d. oxygen gas	ŝ
The force of bottom.	of pulls rocks	from the top of	the mountain to	its
a. river wat	er <b>b.</b> seawater	c. rainwater	<b>d.</b> gravity	
A gentle wir	nd can carry sand gi	rains for di	stances.	
a. short	b. long	c. huge	d. very long	
Weathered	rocks can be eroded	by all the following	factors, except	
a. gravity	b. water	c. sunlight	d. wind	
(B) Write the	scientific term:			
The process of	moving weathered r	ocks from one plac	ce to another. (	_)
tuestion (2)				
(A) Put (/) or	r (X):			
artis.	help in the formation	of rocks.	(	)
	ion of sand dunes in		the movement	of.
water.			(	)
The deposit	ion process never ch	anges the shape of	the Earth's surfac	
	·	,		)
Rivers erode	e rocks from their bo	ınks downstream.	(	)
(B) Cross out	the odd word:		•	
	hering - Deposition	- Digestion	(	)
uestion (3)	3	2		
	om column (A) w	hat cuite it in co	human (R)	
	om column (A) w		idifili (B):	
Column (A)	- basslas as also das	Column (B)		-
1 Delta	a. breaks rocks dow			
Mechanical weathering	<b>b.</b> changes the com	position of the roc	:ks.	
Chemical weathering	c. is a process of set	tling rocks after mo	oving to new place	<u>.</u>
Deposition	d. is a landform of a	deposited sedimen	ts when a river	



#### Currente Citymenters.

#### By the end of this concept:

- Students can ask questions about the causes and stability of landforms that change slowly and quickly.
- Students can provide evidence that weathering and erosion by wind, water, and ice cause changes on the Earth's surface over time.
- Students can develop a model that describes patterns in the formation of deltas and predicts where deltas are likely to form.
- Students can describe the interactions between water and landforms in a watershed and between wind and sand dunes at the beach.
- Students can use evidence from patterns in rock formations to explain the changes in the Earth's surface over time.

#### THE REAL PROPERTY.

- Canyon
  Delta
- · Dune

# Concept 2

### **Changing Landscapes**

تكريمي واللحاصات	the second state of the se
	LESCH III
Activity 1	Can You Explain?
Activity 2	Canyons
	Lesson 2
Activity 3	Hands-on Investigation: Landscapes in Your Environment
	LEDOCT I
Activity 4	Canyon Formation
Activity 5	Canyons and Valleys
	Iuu.4
Activity 6	Delta Formation
Activity 7	Wind Erosion
Activity 8	Hands-on Investigation: Sand Shifters
Activity 9	Describing Landforms

## Lesson



>> Many factors can change the Earth's surface and form new landforms, • تساهم العديد من العوامل في تفيُّر سطح الأرض وتكوين تضاريس حديدة. . Such as canyons



### How are canyons formed



- · A canyon is a landform that can be formed in many ways, including weathering and erosion by wind, water, and other factors.
- Canyons can take millions of years to be formed.
  - الأخدود من التضاريس التي يمكن أن تتكوُّن بعدة طرق، منها: التجوية والتعرية بفعل الرياح والمياه وغيرها من العوامل.
    - بستفرق تكون الأخاديد ملايين السنين.



### ? Activity 2 Canyons

- When the water is moving over the sand, it pushes some of the sand out of the way.
- As the water moves the sand. it leaves an impression of where the water flowed.



عندما يجري الماء على التراب، فإنه يدفع بعض هذا التراب من مكانه.
 أثناء دفع الماء على التراب، فإنه يدفع بعض هذا التراب من مكانه.

#### How can understanding the formation of landforms help predict future change



- >> Scientists look for clues in nature to know how landforms were formed.
- >> Observe the opposite figure that represents a small canyon, then answer.

#### How does the small canyon formed?

· A stream of water may have formed it.

#### What is your evidence?

- There are trees and other plants on both sides that need water to grow.
- The sides are gently sloped as water helps wear the sides down.

#### What happens if? It rained a lot in a small canyon?

The small canyon becomes deeper.

- بيحث العلماء عن أدلة لتحديد أسباب تكون تضاريس سطح الأرض.
- » كيف تكوَّن الأخدود الصغج؟ تكرُّن الأخدود نثيمة لجرى مائي.
  - ه ما هي الأدلة على تكوُّن الأخاديد بفعل للجاري المائية؟
- وجود أشجار ونباتات على جانبي الأخدود تحتاج إلى الماء لتنمو. جوانب الأخدود منحدرة حيث تستبث المياه في تأكلها.
  - إذا زادت الأمطار والمياه الجارية سيتسبُّب ذلك في زيادة عمق الأخدود الصغير.

#### >>> Observe the following figures, then put (✓) or (✗):



Small Canyons in Thailand



Wadi Nakhr in Oman



Wadi Rum in Jordan



Colored Canyon in Sinai

All canyons have the same shape and color.	(	
Wadi Nakhr canyon has a reddish color.	(	
The colored canyon is V-shaped.	(	)
All these landforms take a short period of time to be formed.	(	1

>> You can revise your answers from the following table that explain the similarities and differences between them:

Landform			To the second
Wadi Nakhr	Oman	Brown and Black	
Small Canyons	Thailand	Reddish	
Wadi Rum	Jordan	Reddish	1
Colored Canyon	Sinai in Egypt	Reddish	1

#### Examples of some landforms:



Canyon اخدود



Valley olc.



Mountains جبال



Sand Dunes کثبان رملیة



#### Check your understanding?

- >>> Put (√) or (X):
  - Most canyons are formed by the effect of flowing water. (
  - The shape of the sand doesn't change when water flows over them.
  - Colored Canyon has black and brown colors.
    ( )
  - Small canyons would get deeper if water ran through them again. (

# Exercises on Lesson 1

4	Choose the correct answer:		
	A canyon may take of years to be formed.		
	a. hundreds b. tens c. millions d. couple		
	All the following are examples of landforms found on the Earth	's	
	surface, except		
	a. canyons b. dunes c. buildings d. mounte	ains	
	Canyons can be formed in many ways, including		
	a. weathering only b. erosion only		
	c. weathering and erosion d. erosion and deposition		
	If the rain falls over a canyon for several times per year,	11	
	a. its depth increases b. its depth decreases		
	c.it becomes flat d. not be affected		
	On flowing water from a stream over flat land, a may be formed.	e	
	a. large canyon b. small canyon c. hill d. sand d	une	
	8 Reddish small canyons found in		
	a. Egypt b. Oman c. Jordan d. Thailar	nd	
•	Put (✓) or (X):		
	1. Valleys, canyons, and mountains are different landforms.	(	)
	Wadi Rum in Jordan is an example of a sand dune.	(	)
	A canyon may be formed by the effect of water only.	(	)
	All canyons have the same shape and color.	(	)
	5 The sides of the canyon at the beginning of its formation are		
	gently-sloped.	(	)

Write the scientif	ic term:							
A deep valley formed	ed due to the weathering and eros	ion of wind and						
water. (								
A canyon whose ro	A canyon whose rocks have black and brown colors. (							
A canyon that has a V-shaped in Egypt.								
Complete the follo	owing using the words between	the brackets:						
(small canyon	- impression - V-shaped - water	stream -						
	brown and black colored)							
When the rain falls	on a flat sandy land, it will leave ar	A SERVICE OF THE SERVICE OF THE SERVICE OF						
Wadi-Nakhr is canyon.								
Wadi Rum and colored canyon in Sinai are canyons.								
In the beginning of a formation, plants and trees grow at the								
two sides of it due to the effect of a								
Choose from colu	umn (A) what suits it in colum	n (B):						
Column (A)	Column (B)							
Small canyon	a. is a black and brown canyon in	Oman.						
Wadi Rum	b. is a V-shaped canyon in Jorda	n.						
Wadi Nakhr	c. is a reddish canyon in Thailand							
2 1744AAA 11 - 11 647	(3)	= -						
Cross out the ode	d word:							
Mountain - Valley -	Gravity - Canyon	()						

#### Shifting Surfaces



### Study the following figure, then complete the following sentences:



- 1 This figure represents a \_\_\_\_\_ that is formed in \_\_\_\_\_ of years.
- 2 \_\_\_\_ and \_\_\_ processes help in its formation.

#### Give reasons for:

- Some small canyons have plants and trees on their sides.
- Canyons all over the world have different properties.

### 9

#### What happens if?

- A water stream flows over a flat land?
  - 2 A lot of rain falls on a small canyon?

# Lesson 2



#### Hands-on Investigation: Landscapes in Your Environment

#### >>> Put (√) or (X):

- 1 Sometimes we can see erosion happening.
- Weathering and erosion are rapid processes.

On a rainy day, you can see some changes in the landscape around you on the street.



You can see cracks in the road.

You can see a patch of mud.

#### - Shifting Surfaces

You can see the same processes happen in large landscapes in nature, where:



#### Weathering process:

Instead of broken bricks and rocks due to the growth of roots,

you can see a rounded, worn rock.







#### **Erosion process:**

Instead of cracks
In the road.



you can see the walls of the canyon were eroding due to the effect of water.



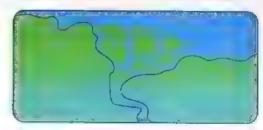


#### **Deposition process:**

Instead of a patch of mud,



you can see a river making new landforms, such as a delta.



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### Give a reason for...

- Recognizing signs of weathering, erosion, and deposition is very useful.

Because it helps us build houses in safe places, where:

 People must not build a house on a hill that is eroding.



 People must not build a house very close to a river.

Because the river path may change, it may cause erosion and the deposition of houses.



### Check your understanding?

Put ( ) or ( )	>>	Put	<b>(/</b> )	or	(X)
----------------	----	-----	-------------	----	-----

When water falls on a small canyon, it could become deeper.	6	When	water	falls	on a	small	canyon, it	could	become	deeper.(	1
---	---	------	-------	-------	------	-------	------------	-------	--------	----------	---

People must build a house close to a river. (	2	People mus	st build a hou	use close to a rive	er. (	)
---	---	------------	----------------	---------------------	-------	---

3)	A	patch	of	mud	in	a	street	on	a	rainy	day	represents	deposition	
----	---	-------	----	-----	----	---	--------	----	---	-------	-----	------------	------------	--

Δ	canuon	can	he	formed	Ьπ	long	eroding	bu	water	(	1
$\sim$	curiyon	Cult	nc	IOITHEU	υy	iong.	croding	Dy	water.		J

#### >> Complete:

- Rocks get broken down by \_\_\_\_\_, and moved through \_\_\_\_\_.

  and dropped, somewhere else through \_\_\_\_\_.
- When water falls on sand, it leaves an \_\_\_\_\_.

# Exercises on Lesson 2

6								
	Choose the correct answer			-				
	1) The shape of a rock gets worr	and rounded by the effect of	-010-111000-1	PRESE PROP				
	process.							
	a. weathering	d. deposition						
	c. erosion	d. photosynthesis						
	is/are evidence of							
	a. A rounded, worn rock	b. A patch of sand on the gr	ound	d				
	c. An area with canyons	d. Red-colored rocks						
	A running water stream can tr	ransport small rocks by pr	oce	SS.				
	a. chemical weathering	b. erosion						
	c. deposition	d. mechanical weathering						
	A river may make a new	at its end through the pr	oce	SS.				
	a. mountain, deposition	b. canyon, erosion						
	c.land, deposition	d. land, weathering						
	Put (✓) or (X):			_				
	when you find a worn rock, it	s evidence of erosion.	(	)				
	Understanding the formation	on of landforms helps predict	futu	re				
	changes in landforms.							
	1 It is better to build your house on a hill that is eroded.							
	A river may create a delta fro	m sediments by deposition.	(	)				
	Deposition is one of the proce	esses that change the Earth's surfa	ice.					
			(	)				
	A river never changes its pat	h, so it's safe to build a house ne	ar a	iny				
	river.		(	)				

Complete the following using	ng the words between the brackets:				
( erosion - many year	rs - deposition - Weathering)				
causes mountain rocks to break off.					
An area with small canyons w	here soil was washed away after heavy				
rain is evidence of	er d				
Sediments can create a new land over long time by					
The deposition process carried	d out by a river takes				
Choose from column (A) what suits it in column (B):					
Column (A)	Column (B)				
① A rounded, worn rock	a. is evidence of deposition.				
An area with small canyons	b.is evidence of erosion.				
A patch of sand on ground	c. is evidence of weathering.				
1 had detailed account of the second					
Give reasons for:					
It is useful to recognize signs o	of weathering, erosion, and deposition.				
maghthirth (higher for your deputherman specimens in the Color opposition to a see up the opposition for the deputher and the second second for the color opposition to the co	by paramodelpar diseases and an entire comparison of the properties of the comparison of the compariso				
It is not safe to build a house close to a river.					
What happens if?					
A house is built close to a river	?				
131: 239: Calabet (in 1914 of Calabet (1894) 114-14-14 (1894) (1894) 23 (1785) (1894)	2008/97/19/20-00/2004/00/99/49/19/19/20/20/99/98/49/30/49/40/49/40/49/49/49/49/49/49/49/49/49/49/49/49/49/				

# Lesson 3





#### Activity 4 Canyon Formation

Many valleys, including canyons, are formed in the same way.



#### Stages of valley formation

- Gravity pulls rainwater downhill, forming small streams.
- Small streams are joined together to form bigger streams (rivers).
- The water of the river moves fast and erodes (carves out) rocks in its pathway.
- When a river dries after a very long time, a new landform may be formed.

#### مراحل تكوين الوديان:

- 🚹 تعمل الجاذبية على سحب مياه الأمطار على طول المنحير مُكوِّنة جداول صفيرة.
  - 2 تتجمُّع الجداول الصغيرة مُكوِّنة جداول أكبر (نهر).
- 🕃 تندفع مياه النهر بسرعة وتقوم بتكسير (نحت) الصخور الموجودة في مسار النهر.
  - [4] عندما يجف النهر بعد فترة طويلة حيًّا، فإنه قد يكون مظهر سطح جديد،

#### Factors affect the shape of the valley

The tupes of rocks | Speed of the river | Age of the river | Size of the river

#### NOTES

- Big streams or rivers cause more erosion than small streams.
  - Fast-moving water causes more erosion than slow-moving water.



They are special types of valleys with steep sides.

الأحاديد: هي نوع خاص من الوديان تتميّز بجوانبها المتحدرة.

- >> Canyons are exciting geologic landforms.
- >>> People travel from all over the world to see and visit them.
- A canyon is a landform that can be formed in many ways, including weathering and erosion by wind, water, and other factors.

#### **The Grand Canyon**

Location:

United States of America

Age:

It is millions of years old.

Shape:

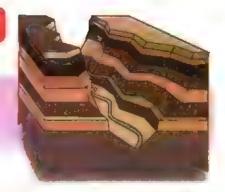
- It is very large and steep.
- It contains many layers of rocks.
- There is a river at the bottom.



- بعتبر أكبر أخدود في العالم.
- بقع في الولايات المتحدة الأمريكية.
- عمره: يعود تكوينه إلى ملابين السنين.
  - الوصف (الشكل):
  - أخدود كبير وعميق جدًا.
- يتكون من العديد من الطبقات الصخرية.
  - هناك نهر يجرئ في أسفله.

#### Formation of the Grand Canyon

Over millions of years ago, the water of the river was moving so quickly down a steep slope.



- The force of this rushing water eroded a lot of sediment and carried it away.
- This process took many millions of years and leads to the formation of the Grand Canyon.

كيف تكوِّن الأخدود العظيم؟:

- 👔 منذ ملايين السنين كانت مياه النهر تتحرُّك بسرعة كبيرة أسفل منحدر شديد الاتحدار.
  - 2] أدَّت قوة هذه للياه المتدفقة إلى تأكل الكثير من الرواسب وحملتها المياه بميدًا.
    - استغراقت هذه العملية ملايئ السنئ؛ مما أدى إلى تكوين الأخدود العظيم.

### 1

#### Check your understanding?

>>	Put	(1)	or	(X):
----	-----	-----	----	------

- The bigger the stream, the more erosion it causes.
  ( )
- Rivers erode rocks and can form valleys and canyons. ( )
- The canyon walls are not very tall and have a gentle slope. ( )
- A canyon is a type of valley.

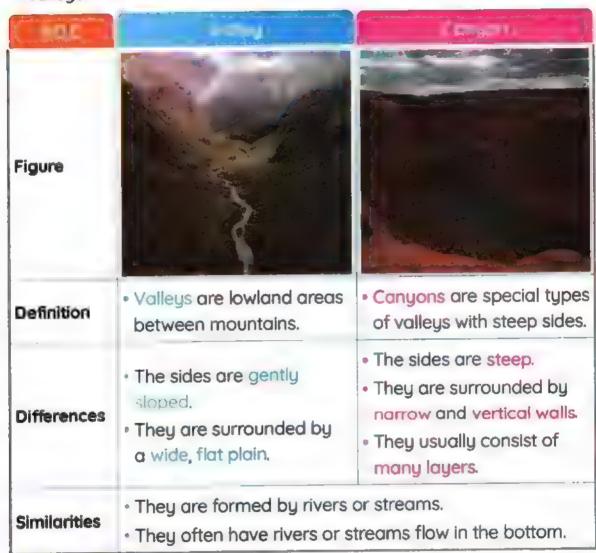
  (
- A canyon is a type of valley.

  Rivers can change landform very slowly.

  ( )
- Fast-moving rivers can cause a lot of erosion.
   ( )



- We have learned that canyons are a special type of valley.
- >> Let's study the similarities and differences between canyons and valleys.





#### Check your understanding?

- >>> Put ( / ) or ( / ):
  - Canyons are a special type of valley with gently sloped sides. (
  - The walls of valley are vertical and narrow.

# Exercises on Lesson 3

	Choose the co	orrect answer:				
	Dpulls	rainwater downh	nill, forming small s	streams.		
	a. Magnetism	b. Gravity	c. Sunlight	d. Wind		
4	<b>a</b> can (	cause more erosi	on.			
	a. A small stream		b. A slow-moving river			
	c. A big river		d. A river moving on a flat land			
4	When a river flo	ws over a surface	e and carves out it	, a is formed.		
	a. canyon	<b>b</b> . delta	c. hill	d. mountain		
. 6	The movement	of sediments do	own a fast-moving	river is considered		
	a. weathering	b. erosion	c. deposition	d. rusting		
1	All the following	factors affect th	e shape of the val	ley, except		
	a. the river's siz	re	b. the river's sp	the river's speed		
	c. the rocks' type		d. the rocks' color			
Q	A canyon and c	valley are comn	non in having	*****************************		
	a. gently sloped sides		b. rivers at the bottom			
	c. steep sides		d. vertical walls	5		
<b>4</b>	A is c	deep valley with	high, steep sides.			
	a. hill	b. mountain	c. canyon	d. dune		
9	are le	owland areas with	n gently-sloped sid	des.		
	a. Valleys	b. Deltas	c. Canyons	d. Dunes		
4	A flowing river r	may form	to the second se			
	a. a valley	b. a canyon	c. a dune	d. a and b		
	Put (✓) or (✗):					
1		oves down a stee	ep slope, its speed	decreases ( )		
		pe of valley with		( )		
01	80 Science Prim. 4 - Second	Terra				

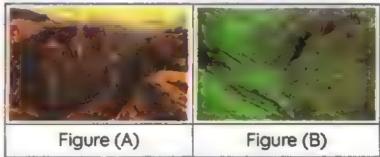
Chan	ging Landsco	pes o				
A river can erode a mountain in a short period of time.	(	)				
The Grand Canyon took millions of years to be created	l. (	)				
The Grand Canyon has a river at its bottom.	(	)				
Canyon walls are not very tall and have gentle slopes.	(	)				
A valley has high and steep walls with many layers of n	ocks. (	)				
Both canyons and valleys often have rivers at their both	toms. (	)				
Most valleys are formed due to the erosion of many sediments and						
their transfer far away.	(	)				
The shape of the valley depends on the type of rock.	(	:)				
A slow-moving river has high energy, so it causes more	erosion. (	)				
		,				
Write the scientific term:						
A force pulls rainwater downhill, forming small streams.						
	(	)				
A special type of valley with steep sides.	Carleman merretical Spinish spensors and	)				
The world's largest canyon, located in the USA.	(	)				
They are often found at the bottom of both canyons an	ıd valleys.					
	(	)				
Complete the following using the words between t	the brack	ets:				
(less - high - more - gravity - increases - sediments - n	nany layer	s)				
Rainwater is pulled downhill, forming small stream due to						
When the water of a river moves downhill a steep slope, the water						
speed erosion.						
A small stream causes erosion than a large ri	iver.					
The force of rushing water erodes a lot of of a	mountain	and				

Walls of canyons are very \_\_\_\_ and composes of \_\_\_\_\_.

carried them away.



#### Study the following figure, then put $(\checkmark)$ or (x):



ı		rigore (A)	rigore (b)		
	The landf	orm in figure (A) has gen	itly-sloped sides.	(	
	The landfe	orm in figure (B) may sui	rround some plains betwe	en	
ı	mountain	S.		(	
	Both land	forms are formed due to	erosion carried by rivers.	(	2
	The walls	of the landform in figure	e (A) are higher than thos	ie in figu	Jre
	(B).			(	2

#### Give reasons for:

- Valleys and canyons are formed in the same way.
- Rainwater is pulled downhill after falling on a mountain.

## What happens if?

- A river erodes the sediments of a mountain over a long period of time?
  - The water of a river moves downhill on a steep slope?
  - Small streams of water join together? (Concerning erosion)

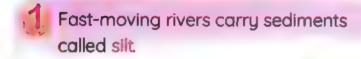
# Lesson



>> Unlike valleys and canyons, deltas are not formed by erosion, but they are formed by deposition.

· على عكس الوديان والأودية، لا تتشكُّل الدلتا عن طريق عملية الثعرية، ولكنها تتشكُّل عن طريق عملية الترسيب.

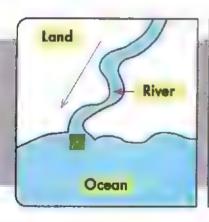
#### -tracks for the fermions

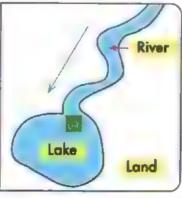


The water of the river is full of sediment that has been collected along the journey.



When the rapid flowing water "of the river" enters still water "lake", or slower water "ocean or sea", water loses energy and drops the sediment that it is carrying forming a delta.





Silt is made up of very fine bits of sand, clay, or rock materials.

#### كيف تكوُّنت الدلتا؟:

- 🚹 تحمل للياه السريعة للأتهار رواسب تُسمى الطميء
- 🙎 تكون مياه النهر مليئة بالرواسب التي جمعتها أثناء تك الرحلة.
- عند التقاء المياه السريعة (النهر) بالمياه الساكنة (بحيرة) أو مياه بطيئة (للحيط أو البحر) يتسبُّب ذلك في فقدان المياه لطاقتها؛ وبالتالي تترسب الرواسب التي تحملها مُكوِّنة الدلتا.





The wetland of plants in the delta helps in increasing deposition.

Because plant's roots are responsible for slowing down the water.

- تساعد جذور نباتات الأراضي الرطبة في الدلتا هذه الأراضي في زيادة عملية الترسيب. حيث تقوم الجذور بإبطاء حركة الماه بشكل أكبر مما يزيد من عملية الترسيب.

#### The Nile River Delta

"The most famous delta in the world".

Triangular shape Shape

It covers over 20,000 km<sup>2</sup> in Egypt Area

Lies between Cairo and the northern coast of Egypt.

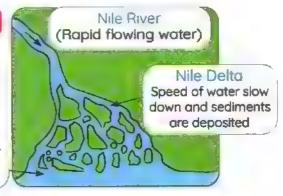
It is characterized by the presence of fertile soil that allows the cultivation of different types of crops.

Location

**Importance** 

The Nile River travels a distance of about 6,600 km to pour into the Mediterranean Sea, where it drops its sediments, forming the Nile Delta.

> Mediterranean Sea (Slow water)





#### Check your understanding?

- >>> Put ( \( \sigma \) or ( \( \sigma \):
  - Canyons and deltas are landforms that were formed by the same process.
  - Farmers use the rich soil in the delta to grow many crops in Egypt.(



The wind in the desert can be a powerful force for change.

تعد رياح الصحراء من القوى الأساسية في إحداث تغيير في مظاهر السطح.

#### Steps of Erosion by Wind

- 1 When wind blows across the land, it picks up sand and other rock particles and carries them along.
- When this flying sediment hits a rock, it wears down that rock like a sandblaster.

are formed? the wind-blown sand.



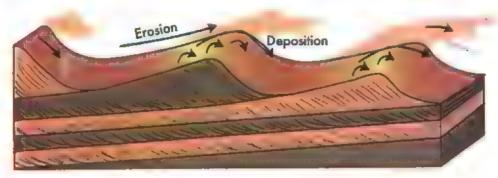
3 This process carves the rock into strange shapes.

حطوات حدوث عملية التعرية بفعل الرياح:

- تحمل الرياح القريبة من سطح الأرض الرمال وجزيئات الصخور وتنقلها من مكانها لمكان آخر.
- 2 عند اصطدام هذه الرواسب المتطايرة بالصخور، فإنها تعمل على نحث هذه الصخور كما لو كانت آلة كشط.
  - قوم تلك العملية بتحويل المصخور إلى أشكال غريبة.

	Sand Dunes
Shape	A hill of sand
Location	Sandy desert or sandy beach.
Area	<ul><li>They are found in groups.</li><li>They may cover a large area. (Hundreds of meters tall).</li></ul>
Process	Erosion and deposition
Factors	Wind-blown sand
How they	Sand dunes are formed when a barrier like a rock blocks

#### Sand Dunes Movements



- >> Dunes are interesting because they are constantly moving, as follows:
  - When wind blows across a dune, sand grains erode away from the side the wind is coming from.



The grains of sand are carried up by the wind along the slope of the dune.



When they reach the top,

3 the dune forms a barrier to the wind. So, the sand grains roll down the other side.

- [] عندما تهب الرياح عبر الكثبان الرملية، تتحرك حبيبات الرمال بعيدًا عن الجانب الذي تأتى منه الرياح.
  - 🔁 تحمل الرياح حبيبات الرمل على طول منحدر الكثبان الرملية.
- 🛐 عندما تصل حبيبات الرمال إلى القمة، تشكل الكثبان الرملية حاجزًا أمام الرباح؛ وبالتالي تتنصرج حبات الرمل لأسفل على الحانب الآخر.

# Check your understanding?

- >>> Put (√) or (✗):
  - Sand dunes are formed by the erosion process only.
    ( )
  - Wind erosion can carve rocks in different shapes. ( )

# Lesson 5





#### Activity 8 Hands-on Investigation: Sand Shifters

- >>> Wind and sand work together to erode rocks.
- >>> When the wind stops blowing, sand and small rocks are deposited in a new place.

# Experiment

In this experiment, you will create a model of sand dunes and study how they are moving.



Aluminium foil pan	Sand	One rock	Straw

#### Steps

- Place a small rock on one side of the pan.
- Put a suitable amount of sand on the other side of the pan.
- Try to blow air on the sand using a straw.
- Repeat the previous steps by changing the force and direction of the wind.

#### Shifting Surfaces

#### Observation

- Sand moves by the force of the wind where,
  - As the force of the wind becomes weaker,
     the sand moves for a shorter distance.
  - As the force of the wind becomes stronger, the sand moves a longer distance.
- >>> When we blow air in the same direction of the rock, the rock blocks the sand and collects it before the rock.

#### Conclusion:

- The dunes are often formed where something blocks the path of the sand, such as rock.
  - The distance that the sand grains move depends on the force of the wind.
  - The way the sand moves depends on the direction of the wind.

# Check your understanding?

#### >>> Put ( \( \sigma \)) or ( \( \sigma \)):

- 1 The distance moved by sand depends on the direction of the wind.
- 2 Sand dunes are in continuous motion due to the movement of the wind.
  ( )





#### Activity 9 Describing Landforms

Examples of some landforms that were formed:



>>> Erosion generally occurs "slowly", but in cases of storms or rockslides, the erosion process may occur rapidly.

• التعرية تحدث عمومًا « بيطاء»، ولكن في حالات العواصف أو الانزلاقات الصخرية قد تحدث عملية التعرية « بسرعة».

- Rivers cause the formation of valleys and canyons.
- Wind and sand work together as a force of erosion in the desert.
  - الأنهار هي السنولة عادةً عن تكوُّن الوديان والأخاديد،
  - تعمل الرياح والرمال ممَّا كقُوى التعرية في الصحراء.

# Exercises on Lessons 4 and 5

di	Choose the co	rrect answer	0					
4	🐞 When a river me	eets a sea or an	ocean, a landform	known as a				
	is formed.							
	a. canyon	b. volcano	c. mountain	<b>d</b> . delta				
	All the following	are created by	the water of river	rs or streams, except				
	Q							
	b. delta	b. canyon	c. valley	d. sand dune				
	Silt carried by w	ater contains a	ll the following, exc	ept				
	a. sand	b. clay	c. rocks	<b>d.</b> glass				
	is the	main process r	esponsible for the	formation of deltas.				
	a. Deposition	b. Erosion	c. Weathering	d. Photosynthesis				
	A delta is forme	d when a	enters an oce	ean.				
	a. lake	b. river	c. mountain	d. hill				
	The Nile River D	elta has	reviewarea adare - 4					
	a. a fertile soil		b. a triangular s	shape				
	c. an infertile so	il	d. a and b					
			process, then the process.					
	·		b. erosion - weathering					
	c. erosion - dep	osition	d. deposition - weathering					
	Sand grains in t	the desert can	move forward or b	packward depending				
	on the	Special di						
	a. wind speed		b. wind directio					
	c. water speed		d. water direction					
				ion of sand dunes?				
	a. Water	b. Wind	c. Light	d. Heat				
				may be formed.				
	a. dune	b. river	c. canyon	<b>d.</b> delta				

(190) Science Prim. 4 - Second Term

(	Put (✓) or (X):						
	The Nile River Delta has fertile soil that allows the cultivation of d	iffer	ent				
	crops.	(	)				
	A delta is formed when the speed of river water increases.	(	)				
	Plants of wetland and their roots don't affect the deposition pro	ces	5.				
		(	)				
	Silt carried by a river contains large bits of sand and clay.	(	)				
	Sand dunes are formed when a rock blocks water-blown sand.	(	)				
	Sand dunes may be found in a sandy desert or on a beach.	(	)				
	Sand dunes are formed by the deposition process only.						
	Sand grains are deposited on the same side of the rock where the	ney (	are				
	eroded.	(	)				
	Wind can't break down a rock.	(	)				
	Sand dunes are stable landforms that don't move.	(	)				
	The formation of sand dunes in the Eastern Desert in Egypt is	due	to				
	the movement of wind.	(	)				
T	Dunes are formed at the bottom of seas.	(	)				
	Write the scientific term:		Ì				
	Sediments carried by a river that contains sand, clay, and rock ma	ntari	als				
1	Sediments corned by a river triat contains saira, ciag, and rock in a						
	A fan-shaped land that is formed when a river meets a sea.						
	(	111/W B1800000	)				
	The sea in which Nile River Delta pours its water. (		1				
	A process that causes the carving of rocks into different sha						
	wind-blown sand.	p	)				
T,	The landform that is formed by the erosion and deposition of so	and.					
	Commence and an adjustment and an adjustment and an adjustment and an adjustment and an adjustment and adjustme		)				

#### Shifting Surfaces

100	
-	7
70	

#### Complete the following using the words between the brackets:

(deposition – canyon – fan – decreases – increases – delta)

- 1 A \_\_\_\_\_ is formed by the erosion process, while a \_\_\_\_ is formed by the deposition process.
  2 The Nile River Delta has a \_\_\_\_\_ shape.
  3 When the stream water speed \_\_\_\_\_, it causes \_\_\_\_\_ of sediments.
- 4 When the force of blowing wind \_\_\_\_\_, the blown sand is carried for longer distance.



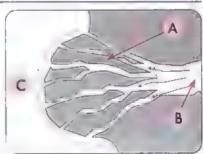
#### Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1 Erosion	a. is fine particles of clay, sand and rock materials.
2 Deposition	b. occurs when a stream water rushes quickly downhill a mountain.
3 Sand dunes	c. are hills of sand usually seen in groups and they may cover large areas.
4 Silt	d. occurs when a stream water speed slows down at the end of a river.



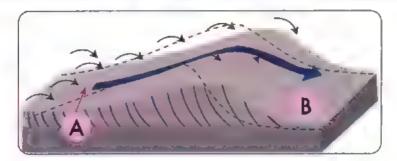
#### Study the following figure, then choose the correct answer:

- The area (A) would become a \_\_\_\_\_\_ (delta - canyon) due to the \_\_\_\_\_ (erosion - deposition) process.
- 2 The \_\_\_\_ (area "C" area "B") could be a sea or a lake.
- 3 The \_\_\_\_\_ (area "C" area "B") is a river.





#### Study the following figure, then complete:





2 Deposition of wind-blown sand occurs in area number		_
---	--	---

#### Give reasons for:

🕦 Plants of wetland and their roots help in the formation a de	lta.
--	------

2	Silt	carried	bu o	river	is	deposited	when	the	river	enters	the	ocean.
100			~9 `				****				4	

-	Diameta	Les	wattand	increases	tha	deposition	rata	of cile	carriad	bu	0 F	ivor
1510	Piants	ш	wellana	increase	me	aeposition	rate (	JI SIII	carnea	DU	u r	IVEL
700										-		

1	Sand	dunes	ore	formed	in a	desert
S	Juliu	COLICS	UI C	TOTTIEC	HI CA	GCSCI L

#### What happens if?

A river	carrying	sediments me	eets a sea	· ·

Wind-blown sand grains hit a big rock in desert?

Wind blows from South to North on sand dunes in a desert?

# Model Excens on Concept 4.2



C	Question (1)
	(A) Choose the correct answer:
	Canyons can be formed in many ways, including
	a. weathering only b. erosion only
	c. weathering and erosion d. erosion and deposition
	The shape of a rock gets worn and rounded by the effect of the
	process.
	a. weathering d. deposition c. erosion d. photosynthesis
	are lowland areas in between mountains with gently-sloped sides.
	a. Valleys b. Deltas c. Canyons d. Dunes
	All the following are created by the water of rivers or streams, except
	a
	a. delta b. canyon c. valley d. sand dune
	(B) What happens if? A lot of rain falls on a small canyon?
7	Juestion (2)
_	
	(A) Put (/) or (X):  The sides of the capuer at the beginning of its formation are cently.
	The sides of the canyon at the beginning of its formation are gently-sloped.
	A river may create a delta from sediments by deposition. ( )
	Dunes are formed at the bottom of seas.
	Sand grains in the desert can move forward or backward depending
	on wind speed. ( )
	(B) Give a reason for: It is not safe to build a house close to a river.
-	Question 3
	(A) complete the following using the words between the brackets:
	(more - delta - sand dune - less - sediments)
	1 When a rock blocks the path of flying sand, a may be formed.
	is formed when a river carrying enters an ocean.
	3 A small stream causes erosion than a large river.
	(B) Write the scientific term:
	A special type of valleys with steep sides. ()

## Modelt Exam 2

Acces and a second	
LJUESTION	
Question	

(A)	Choose	the	correct	answer:
-----	--------	-----	---------	---------

- Which of the following factors helps in the formation of sand dunes?
  - Water
- b. Wind
- c. Light
- d. Heat
- A canyon may take \_\_\_\_ of years to be formed.
  - a hundreds
- b. tens
- c. millions
- **d.** couple
- All the following factors affect the shape of the valley, except the .
  - a. river's size
- b. river's speed c. rocks' type
- d. rocks' color
- - a. its depth increases
- b. its depth decreases

c. it becomes flat

d. it isn't affected

#### (B) Write the scientific term:

The two processes that cause the formation of canyons. (.

#### Question (2)

#### (A) Put (/) or (X):

- Wadi Nakhar is a type of V-shaped canyons.
- When a river moves downhill on a steep slope, its speed decreases.
- Both canyons and valleys often have rivers at their bottoms.
- Sand dunes can be seen separately and cover a small area.
- (B) Cross out the odd word: Canyon Valley Gravity Sand dune

#### Question (3

#### (A) Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
Sand dunes	a. are lowland areas between mountains with
	genlty-sloped sides.
2 Valleys	b. they are formed by erosion and deposition.
(3) Canyons	c. are fine bits of clay, sand, and rock materials.
(4) Silts	d. are landforms that have steep-sloped sides.

(B) What happens if? A river carrying sediments meets a sea?

## School Book

# Assess your Learning on Unit 4

Choose the correct answer:	
1 When a rock's surface is eroded di	ue to weather factors, such as air or
water, this indicates the occurrenc	e of
a. weathering b. deposition	c. transfer d. erosion
2 Dissolving metals and forming roc	ks is an example of
a. mechanical weathering	b. weathering by wind
c. deposition in rivers	d. chemical weathering
3 Which of the following Indicate	s the occurrence of a chemica
weathering process?	
a. Water freezes Inside cracks in r	ocks.
b. Mixing the acidic water with roc	:ks.
C. Trees' roots grow inside cracks	in rocks.
4 What is the process in which the la	ndforms change due to weathering
factors?	
a. Expansion b. Weathering	c. Erosion d. Evaporation
5 When rocks are broken down in	nto small pleces, this indicates the
occurrence ofprocess.	
a. mechanical weathering	b. chemical weathering
c. erosion by wind	d. erosion by water
6 Which of the following is evidence	of erosion?
<ul> <li>Sand dunes formation</li> </ul>	b. Forming rock crumbs
c. Nile delta formation	d. Forming of sedimentary rock
7 The formation of a red-rust layer i	in sedimentary rocks is evidence of
the occurring of process.	
a. erosion of sedimentary rocks	b. mechanical weathering
c. chemical weathering	d. transfer and deposit of crumbs
8 Steep valleys formed due to flowing	ng water erosion are called
a. canyons b. sand dunes	c. hills d. deltas

- The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of \_\_\_\_\_.
  - a floods
- b. wind
- c. waves
- d. torrents
- At the convergence of flowing river water that carries clay and sand sediments with the sea, a landform called a \_\_\_\_ is formed.
  - a. delta
- b sand dune c. dam
- d. canuon
- Which of the following landforms is steep and formed due to the power of flowing water erosion?
  - a. Plain
- b. Valley
- c. Canyon
- d Mountain
- The following are photos of landforms. Each of them is evidence of the occurrence of a geological process. Connect each process with its evidence of occurrence:

Erosion by water



Deposits of rivers



Erosion and deposition due to wind



# Glossary

	WW. 007	- Concept 1 (Dev	ices and E	nergy)
Lesson	(1)			
Devices	الأجهزة	Energy	ālija.	Convert -eb
Technology	تكنولوجيا	Remote-controlled حکم عن بُقْد	i cars سيارات تعمل بالت	Mors Curiosity Rover پة اكتشاف العريخ
Solar panels	الألواح الشمسية	Resources	المواري	ىل Transform
Truck , `	شاجنة	Plane ·	طائرة	Boat of Park and the wo
Operated remote	تعمل عن بُعْد الناه	Tasks	مهام	تعملاند Turning corner
Battery	يطارية	Store	يخزن	طاقة الكيميائية  Chemical energy
Sensors	مستشعرات	Electrical energy 4	الطاقة الكهربائية	طاتة الصرتية Sound energy
Run out	ينقذ	Recharge		عبدال Replace
Spacecraft	مركبة فشائية	Missions	بعثات	ابس Socket/Plug
4.0000	(2)			
Consumed energ	الطاقة المستهلكة ل: إ	Input energy	انطاقة المستهلكة	طاقة الناتجة Produced energy
Output energy	مخرجات الطاقة	Hairdryer	مجلف شعر	وزع الصابون Soop dispenser
Movement	حركة	Clapping	تصميق	Rubbing your hand عيديك
Growth	نمو	Convert	يتحول	شب Wood
Burn	حرق	Release	ينتج	Coal en to en
Remains	بالبايا	Electrical cords	أسلاك كهربائية	لك كهربائي Electrical wire
Copper .	نحاس	Leaks out	يتسرپ	
Locon	(3)			
Friction	احتكاك	Road	طريق	نترب Approach
Disappear -	يفتقي	Form ,	يشكل	Attention ' ' sign
Electric bulb	مسباح كهربائي	Washing machine	غسالة	ملل Analyze
Determine	احسب	Record :	سچل ا	تقل 🔧 🕜 Transfer
Mixer/Blender	خلاط	Warming	التدفئة	
Lessen	(4)			
Energy flow	مسار الطالة	Track energy path	way تتبُّع مسار الطاقة	Cell phone (Mobile) تليقون المحمول
Vibrations	الامتزازات	Job/Function	وظيفة	Lost But
Noise	ضوضاء 🔒 🚉	1		
	U	nit 3 – Concept 2	(About Fue	el)
Lesson	(1)			
Oil 1	زيت	Coal .	. لعم	از طبيعي Natural gas
Fossil fuel	الوقود الحفري	Extract	يستخلص	طن الأرض Underground
Pointer	مۇشى ،	Operate '	يشغل :	Means of transportation ببائل النقل

Lesson	(2)				
Considered	يعتبر	Release	تنتج	Biofuel	الوقود الحيوي
Planted	مزروع	Renewable	متجدد	Corn	الذرة ب
Wood chips	رقائق الغشب	Ancient	قديم	Charcoal	فحم نباتي
Conservation	بقاه	Require	يتطلب	Deforestation	إزالة الغابات
Negative impact	تأثير سلبي	Remoins	بقايا	Require	يتطلب
Pressure	ضغط	Conserve	يحفظ	Settle on	تستقر على
Replace	يستبدل	Sea creatures	كائنات محرية	Cover	يقطي
Sediments	رواسب	Rocks	منخور	Run out	ينقذ
Convert	يحول	Available	متاح		
( Increase )	(3)				
Steam	پمار	Regions	المناطق	Condle	شعة
Appreciate	يقدر	ىقىس Unplug	اقصل الجهاز عن الـ	Appliances	الأجهزة
Turbines	التوربينات	Generators spin	تدور المولدات		
Lasson	(4)				
Trap	يحبس	Industry	مناعة	Agriculture	الزراعة
Smog	الضياب الدخاني	Pesticides	مبيدات حشرية	Irritation	تهيج ِ
Breathe	يتناس	Lungs	الرئتان	Damage	ينمر
Acid rain	الأمطار الحمضية	Global warming	الاحتياس المراري	Combine	محمد المارات
Atmosphere	القلاف الجوي				

				7/15	A PARK NO
					Lesso
أتابيب	Pipes	طواحين المياه	Watermills	ملواحين الهواء	Windmills
ملحن الحيوب	Grind the grains	شفرات الطاحونة	Mill's blodes	וצצט	Machines
ثهب	Blow	āiKī	Cost	الدنيق	Flour
التوريينات الجديثا	Modern turbines	الطواحين القديمة	Old windmills	وظيفة	Function
الفلاف الجوي	Atmosphere	الطاقة الإشعاعية	Radiant energy	أشعة الشمس	Sunroys
محاصيل	Crops	المزارعون	Farmers	الصوية الزراعية	Greenhouse
تجمع	Collect	المرايا المنحنية	Concave mirrors	مناخ	Climate
				الألواح الشمسية	Solar panels
				r(2)	Lescon
		المولد	Generator	معدات الري Irrigation equipment	
				1/22	110501
عملية التكثيف	Condensation	عملية التيخر	Evaporation	السدود	Dams .
إعادة تعبئة	Refill	نورة المياه	Water cycle	مروحة ورقية	Pinwheel

		ept 1 (Breaking I	own and M	ioving Hocks)	
Lesso	n_(1)	_			
Break down	تكسير	Weather change	تغيرات مناخية	Landscapes	مظاهر السطح
Wind blow	تهب الرياح	Wear away rocks	تفتيت الصخور	Weathering	التجوية
Sand dunes	الكثبان الرملية	Footprints	أثار الأقدام	Sandcastle	للعة رملية
Collision	تصادم	Coastal rocks	الصخور الساهلية	Needle	الإبر
Canyon	الأخدود	Steep	متحدرة		
Lenno	n-(2)				
Erosion	التعرية	Deposition	الترسيب	Rushing water	ماه مندفع
Pepbles		C1 - 1 - 1	101	Peeling on a build	ding
Peddies	حصي	Statue	تمثال	بنى	تقشير طلاه على الم
Rust	صدأ ب اب	Decide :	يقري ۽ دد د	Evidence	remiser del
Enormous	صغم	Sand rushes	اندفاع الرمل	Sondpaper	ررق الصنفرة
Boulder	صفرة كبيرة	Dissolve	تذوب	Cave	كهاف
Limestone	المجر الجيري	Element	عثمير	Lichens	لأشنات
LE000	n.(2)				
Antacid tablet 3	قرص مضاد للحموض	Disso ution	فمثل	Exposed to	يتعرض ئــ
Lesso	n-(4)				
Erode	يتاكل	Beach	شاطئ	Deposition	لترسيب
Formland	الأراضي الزراعية	Flash floods	القيضانات المفاجئة	Hurricanes	لأعاصير
Landslides	الانهيارات الأرضية	Creek	ممر ماڻي	Picks up	بمعل
Sediment	رواسي .	Mud -	طین , طین	Remains: ,	المالية المالية
Settling	استقرار	Western Desert	الصحراء القربية	Peninsula	ئيه جزيرة
	linit 4 -	Concept 2 (Cha	naina Land	scanes	
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Factors	aelad	Impression	آثر	Evidence	لدليل
Clues	أدلة	Worn rock	صخرة متآكلة	Slope	تحدار – ميل
Deep	عمق	Valley	وادٍ		
1esso	m (15))				
Cracks	شفوق ﴿ الْأَكُولُ اللَّهِ الْمُولِ	Patch of mud	رقعة من الطين		
1.7000	n-(3)			-	
Streoms	جداول میاه	Landforms	تضاريس	Carve	تعن
Steep slope	متحدن شبيد الاتمنار	Layers	طيقات	Sediments	واسب
Lowland	أرض متخفضة	Flat plain	سهل متيسط	Vertical walls	واثط رأسية
Lacar					
Silt	طمي	Still water	مياه ساكتة	Particles	زيئات
Waterland	أرش رطبة	Barrier	ما <b>چ</b> ڙ	Fertile soil	قيمة قي
1-0000	n (5)				
2/0/010					



# SCIENCE

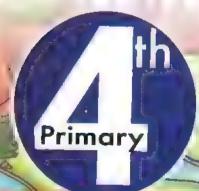
# Revision Book

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Second form

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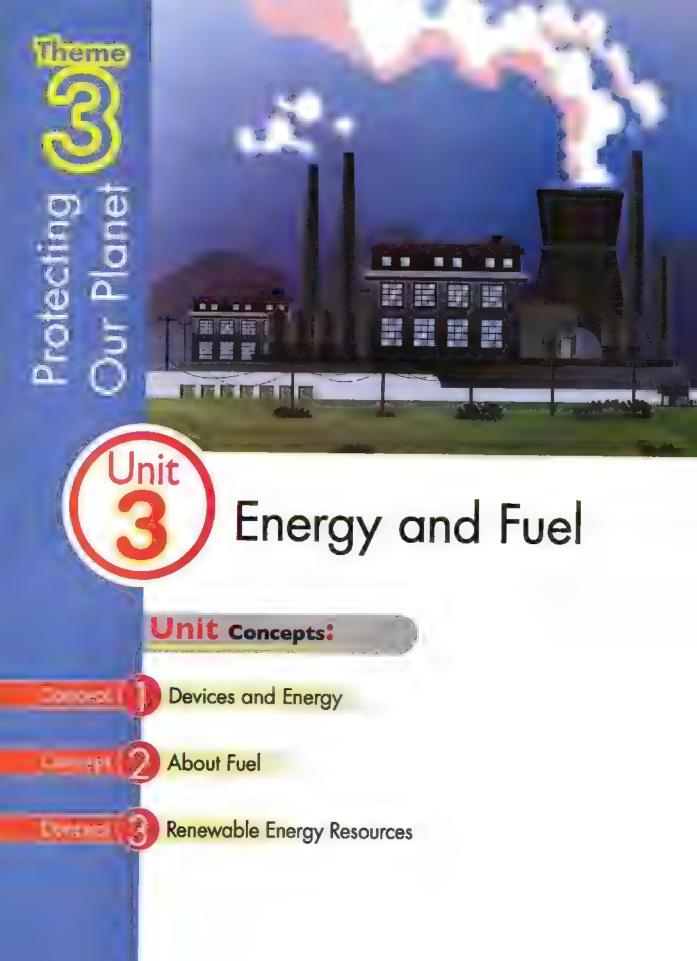
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# Devices and Energy

## 1 Summary of Concept 1

It is the source of energy for remotelycontrolled toys.

When a battery runs out (exhausts), it must be recharged or replaced with a new one.



It stores chemical energy inside it.

**Battery** 

It produces electrical energy

#### Energy change inside a toy car:

Chemical
energy
(stored in the battery)



electrical energy



kinetic energy and sound energy

#### Mars Curiosity Rover:

It is a robotic vechile that explores Mars.



It is operated remotely from a distance.

Mars Curiosity Rover

It uses solar panels to get the electrical energy needed to recharge its batteries.

It takes about 6 months or more to reach Mars, as Mars is about 54 kilometers away from Earth.

#### **Energy and devices:**

Not all the energy in the energy chain reaches the device.

Some produced energy doesn't help the device do its function, and it's called "lost energy".

Most of the lost energy in a device leaks out in the form of heat.

The amount of energy that enters a device must be equal to the amount that comes out of it.

#### Low of Conservation of Energy

Energy is neither created nor destroyed; it can only be converted from one form to another.

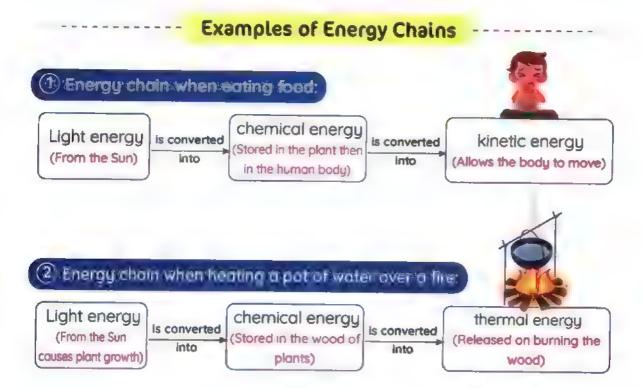
Device	Consumed Energy (Input Energy)	Produced Energy (Output Energy)
• Hair dryer	Electrical energy	Thermal energy Sound energy Kinetic energy
<ul><li>Blender (mixer)</li><li>Washing machine</li><li>Vacuum cleaner</li></ul>	Electrical energy	Kinetic energy Sound energy
Television     Mobile phone	Electrical energy	Light energy Sound energy
Electric fan	Electrical energy	Kinetic energy
Electric Iron     Kettle (boiler)	Electrical energy	Thermal energy
Soap dispenser	Potential energy (Stored in the spring)	Kinetic energy (Movement of the soap upward)

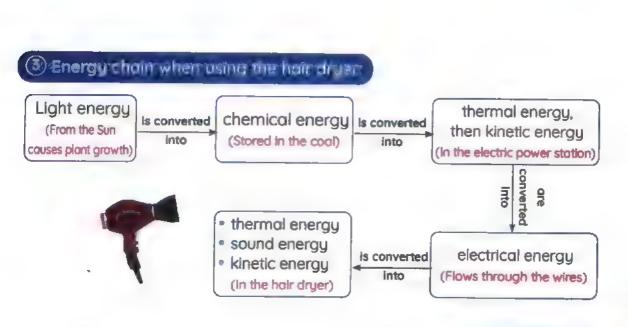
Device	Consumed Energy (Input Energy)	Produced Energy (Output Energy)
Hand bell  Drum  Guitar	Kinetic energy	Sound energy
Radio     Door bell	Electrical energy	Sound energy
Remote-controlled car	Chemical energy	Kinetic energy Sound energy
Battery-powered clock	Chemical energy	Kinetic energy
• Flashlight	Chemical energy	Light energy Thermal energy
• Electric bulb (lamp)	Electrical energy	Light energy Thermal energy

	Output Energy		
Device	Energy that helps the device do its function	Lost Energy (doesn't help the device in its function)	
Hair dryer	Thermal energy	Sound energy	
<ul><li>Blender</li><li>Washing machine</li></ul>	Kinetic energy	Sound energy Thermal energy	
<ul><li>Mobile phone</li><li>Television</li></ul>	Light energy Sound energy	Thermal energy	
Remote-controlled car	Kinetic energy	Thermal energy	

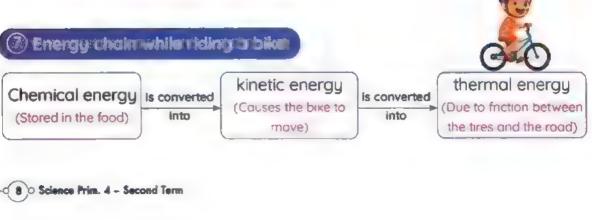
#### **Energy chain:**

- Energy chain is the path of energy from the Sun to different devices.
- Each energy chain starts with the Sun.
- The Sun is the main source of energy on Earth.









# 2 Definitions of Concept 1

Chemical energy	<ul> <li>It's a form of energy stored in the battery.</li> <li>It's a form of energy stored in the human body.</li> </ul>
Curiosity Rover	It's a robotic vehicle that can be controlled from a distance and is used to explore the surface of Mars.
Solar panel	It's a tool that converts solar energy into electrical energy in Mars Rover.
Input energy	It's the energy consumed in the device.
Output energy	It's the energy produced from the device.
Lost energy	It's the energy produced by the device that doesn't help it perform its function.
Energy chain	It is the path of energy from the Sun to different devices.
The Sun	It's the main source of energy for most forms of energies on Earth.
Thermal energy	<ul> <li>It's the energy produced when the wood of trees is burned.</li> <li>It's the energy that is always produced due to friction.</li> <li>It's the energy lost while using a computer.</li> </ul>
Sound energy	It's the energy produced from playing the guitar or drums.
Light energy	It's the energy that helps a light bulb do its main job.
Electrical energy	It's the energy that flows in wires until it reaches the devices.
Copper	It's the material from which electric wires are made.
Law of Conservation of Energy	Energy is neither created nor destroyed; it can only be converted from one form to another.

## Give Reasons for Concept 1

#### 1 All toys operated remotely need energy.

• To move and do tasks, such as turning corners or moving their arms.

#### 2 After a while of operating a toy car, it stops.

· Because the batteries are exhausted.

#### The batteries used in the toys cannot be used to charge the Curiosity Rover.

Because Mars Curiosity Rover is very far from any store or any plug.

#### Any energy chain starts with the Sun.

Because the Sun is the main source of energy.

#### 5 Energy is conserved.

 Because energy is neither created nor destroyed; it can only be converted from one form to another.

#### Not all the energy that enters the device reaches it.

 Because some of the input energy escapes into other forms that the device does not use.

# During running, there is a change of energy that takes place inside your body.

 Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.

#### When burning some wood from trees, there is a change in energy.

 When the wood from trees is burned, the chemical energy stored in the wood is converted into thermal energy.

#### When you touch an electric lamp, you feel heat.

Because electrical energy changes into light and heat energies.

#### Thermal energy is considered a wasted material in some home devices.

Because thermal energy doesn't help some devices do their main jobs.

# 4 What Happens if...? Concept 1

- A toy car is operated remotely?
  - The chemical energy stored in the batteries changes to electrical energy and then to kinetic energy to move the toy car.
- The batteries of a toy car are exhausted?
  - The toy car stops moving.
- An electric bulb is operated?
  - Electrical energy changes into light and thermal energies.
- An electric fan is operated?
  - · Electrical energy changes into kinetic energy.
- You rub your hands?
  - Kinetic energy changes into thermal energy.
- The bike rider pushes the paddles with his legs?
  - The chemical energy stored in his body changes into kinetic energy.
- You approach your hand to a light bulb?
  - I will feel the heat of the lamp.

# 5 Revision on Concept 1

Choose the co	rrect answer:		
1 Most toys deper	nd on as	a source of ene	rgy.
a. water	<b>b</b> , batteries	c. fuel	d. food
2 Batteries store	energy in	side them.	
a. chemical	b. electrical	c. solar	d. kinetic
3 Curiosity Rover	is designed to ex	cplore	
a. the Sun	b. the moon	c. Mars	d. Earth
4 is conside	ered the main so	urce of energy (	on the Earth's surfac
a. Fuel	b. The moon	c. The Sun	d. A battery
5 Some energy is	lost in most dev	ices in the form	ofenergy.
a. electrical	<b>b</b> . thermal	c. sound	d, kinetic
6 Electric wires ar	re made up of	wasters and the same of the sa	
a. plastic	b. wood	c. iron	d. copper
7 The input energ	y in Curiosity Ro	ver is er	nergy.
a. thermal	<b>b</b> . solar	c. electrical	d. kinetic
8 All of the follow	ing store chemic	al energy, excep	ot
a. a battery		b. an apple	
c. a compresse	ed spring	d. coal	
9 All the following			
a. hair dryer	b. watch	c. kettle	d. electric heater
10 The use	es thermal energ	y to do its funct	ion.
a. mobile phon	e	<b>b.</b> washing n	nachine
c. TV		d, hair dryer	
11 The produced	energy d	oesn't help the l	olender do its job.
a. sound	b. thermal	c. chemical	d. potential

Concept	(1	):	<b>Devices</b>	and	Energy	c
---------	----	----	----------------	-----	--------	---

1	When you turn o	n your television	n, the electrical e	nergy travels	5	
	through the	until it reache	es it.			
	<b>a</b> .wires	<b>b</b> .air	<b>c.</b> screens	d.plastics		
13	B During riding a	bike, some kı <mark>ne</mark>	tic energy is co	nverted into	#******* ***	
	energy due to th	e friction of the l	bike's tires with t	ne road.		
	a.chemical	<b>b</b> .potential	c.thermal	d.electrical		
14	During charging	a mobile phone	e, the ene	ergy is stored	d in	the
	battery as	energy.				
	a.chemical - ele	ctrical	b.electrical - c	hemical		
	c.electrical - sou	end	d.chemical - li	ght		
15	All the following	are from the cor	nsumed or produ	uced energie	s in	the
	mobile phone, ex	cept the				
	a.chemical ener	gy	b.light energy			
	c. sound energy		d.potential en	ergy		
	Put (✓) or (X):					
1	Mars Rover and t	toy cars can be	operated from a	distance.	(	
2	Mars is located a	few kilometers of	away from Earth	ŧ	(	)
3	It takes several de	ays for a spaced	raft to reach Ma	ırs.	(	)
4	Most energy chai	ns start with the	moon.		(	)
5	The energy chain	of a burning can	dle is composed	of chemical	ener	gy
	converted into the	ermal energy an	d light energy.		(	)
6	Energy can't be to	ransformed from	n one form to an	other.	(	)
7	Both the electric b	oulb and the elec	tric heater produ	ce thermal e	ener	gy.
					(	)
8	When you rub yo	ur hands, kınetic	energy changes	s to heat ene	rgy.	
					(	)
9	The produced sou	und energy help:	s the blender do	its function.		
					-	)

0	Final Revision		
	There is energy loss when energy is transformed from	one form	to
	another.	(	)
	<b>(II)</b> When pedalling a bike, the chemical energy in your bod	y changes	to
	kinetic energy.	(	)
	The produced sound energy helps the hair dryer do its for	unction. (	)
	The amount of energy entering any device equals the energies produced by it.		the )
	The amount of electrical energy used to charge a mo		
	greater than the produced light energy.	. (	)
4	Write the scientific term:		
	It's a robot vehicle that is used to explore the surface of Mars	5. (	)
	It's the form of energy that is stored in a battery.	(	)
	1t's the main source of energy for most forms of energy	ies on Ea	rth.
		(	)
	It's the energy produced when the wood of trees is burned	d. (	)
	It's the energy is stored in plants in the form of sugar.	(	)
	It's a path that shows the energy flow from its source to	the device	<b>)</b> .
		(	)
	It's a device used to convert electrical energy into light energ	y. (	)
	(3) It's the output energy that helps the electric kettle do its	function.	
		(	)
	It's the energy produced from the blender that helps	it do its j	ob.
		(	)
	11's the energy produced from playing the guitar.	(	)
	1 It's the lost energy when using a computer.	(	)
	12 It's the energy that is always produced due to friction.	(	)
	(1) It's the material that electric wires are made from.	(	)
	It's the lost energy when using the mobile for a long time.	(	)

Complete the fo	ollowing sentences:
1 In any energy cha	ain, some of the energy is lost in the form of
The energies the	at are produced from the washing machine ar
energy	y and energy.
can be	used in electric power stations to generate electricit
In the electric hea	ater,energy is considered an input energy
while thermal ene	ergy is considered an energy.
To operate an elec	ctric mixer, we use energy.
Cross out the o	dd word:
1 Food – Battery – L	_amp - Coal
Hair dryer – Blend	ler – Washing machine – Light bulb (
Choose from co	olumn (A) what suits it in column (B):
	(D).
A	
@ 1	
Column (A)	Column (B)
Solar energy	a.is the source of energy for Curiosity Rover.
Solar energy	a.is the source of energy for Curiosity Rover.
<ul><li>Solar energy</li><li>Chemical energy</li></ul>	<ul><li>a.is the source of energy for Curiosity Rover.</li><li>b.is produced when the toy car is operated.</li></ul>
<ul><li>Solar energy</li><li>Chemical energy</li></ul>	<ul><li>a.is the source of energy for Curiosity Rover.</li><li>b.is produced when the toy car is operated.</li></ul>
Solar energy Chemical energy Kinetic energy	a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery.
<ul><li>Solar energy</li><li>Chemical energy</li></ul>	<ul><li>a.is the source of energy for Curiosity Rover.</li><li>b.is produced when the toy car is operated.</li></ul>
Solar energy Chemical energy Kinetic energy	a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery.
Solar energy Chemical energy Kinetic energy  Column (A)	a.is the source of energy for Curiosity Rover.  b.is produced when the toy car is operated.  c.is stored inside a battery.  Column (B)
Solar energy Chemical energy Kinetic energy Column (A) Chemical energy	a.is the source of energy for Curiosity Rover.  b.is produced when the toy car is operated.  c.is stored inside a battery.  Column (B)  a.is the energy produced during running.
Solar energy Chemical energy Kinetic energy Column (A) Chemical energy Sound energy	a.is the source of energy for Curiosity Rover.  b.is produced when the toy car is operated.  c.is stored inside a battery.  Column (B)  a.is the energy produced during running.  b.is the input energy in a soap dispenser.



Column (A)	Column (B)	
1 Solar panels a. converts electrical energy into sound ener		
2 Electric fan	<ul> <li>b. changes electrical energy into light and thermal energies.</li> </ul>	
3 Radio	c. changes electrical energy into kinetic energy.	
4 Electric bulb	d. change solar energy into electrical energy.	

1:\_\_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_



Column (A)	Column (B)		
1 Chemical energy	a. is the lost energy when operating a mobile device for a long time.		
2 Light energy	b. is used to charge the mobile battery.		
3 Electrical energy	c. is stored inside the mobile battery.		
4 Thermal energy	d. is produced from the mobile phone.		



#### Study the following figures, then complete the questions below:

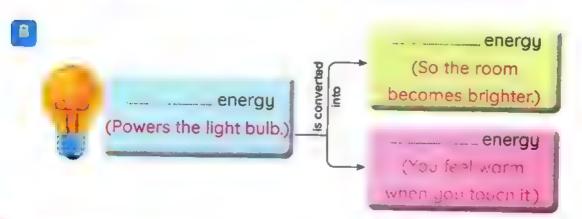


- 1 \_\_\_\_\_ energy is the output energy in all these figures.
- 2 Figure ( . . ) depends on solar energy to be operated.
- 3 Figures ( \_\_\_\_) and ( \_\_\_) can be controlled from a distance.
- The input energy of figure ( \_\_\_\_\_) is the chemical energy stored in the battery.
- 5 The input energy of figure (\_\_\_.) is potential energy.



#### Complete the following diagrams:





#### Give reasons for:

- The batteries used to operate toys can't be used in operating the Mars Rover.
- There is a change in energy when burning the wood of trees.
- During running, there is a change of energy in your body.

	You feel warm when you put your hands near a lighted light bu
	The sound energy produced from the blender is a lost energy.
	The thermal energy produced from the electric heater isn't lost energy.
1	What happens if? You rub your hands? (According to energy changes)
	You rub your hands? (According to energy changes)

# About Fuel

# 1 Summary of Concept 2

- The Sun is considered the main source of energy.
- Fuel stores chemical energy inside it.
- Fuel is a material that releases thermal energy when burned.

## Uses of fuel:



Gasoline or natural gas

are used in operating all means of transportation.

Oil, natural gas, or coal are used in generating electricity.





Coal or wood are used in warming houses.

Coal, natural gas, or wood are used in cooking food.





- A car needs fuel to move.
- As the speed of the car increases, the amount of used fuel increases.
- If the fuel runs out, the car will stop.



#### How is a car operated



- 1 Gasoline burns inside the car's engine. (Thermal energy)
- 2 The car's engine rotates the wheels of the car. (Kinetic energy)



## Types of fuel:

# **Biofuel**

Renewable resource



### Fossil Fuel

Nonrenewable resource



 It is the fuel that is made from living things that can be planted



- It is the fuel that was formed from the remains of plants and animals that lived millions of years ago.
- Fossil fuel is extracted from underground.

#### Examples

- 1 Wood (The most ancient fuel)
- 2 Grass
- 3 Com
- 4 Charcoal (Made from wood)
- 5 Liquid fuel (Made from corn, grass, and wood chips)
- 1 Coal (Decomposition of the remains of ancient plants)
- 2 Oil and natural aas (Decomposition of marine animals)
- 3 Gasoline (Formed from oil)

#### Disadvantages

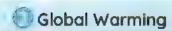
- To get it, it requires cutting down trees which may lead to deforestation.
- Burning fossil fuel produces carbon dioxide gas that may cause air pollution, acid rain and global warming.

### How do we conserve fossil fuel



- 1 Walking or biking instead of driving a car.
- 2 Turning off the lights when you aren't in a room.
- 3 Replacing fossil fuel with renewable energy resources.

# 1 Acid Rain



#### Way of Formation

- Carbon dioxide gas combines with water in the air to form acid rain.
- The amount of carbon dioxide gas in the air increases forming a layer in the atmosphere.
- 2 This layer traps heat on the Earth, raising Earth's temperature.

#### Disadvantages

- Trees die. GR

  Due to the chemical changes in the structure of the soil.
- Due to the chemical changes in the structure of the lakes.
- 3 Decomposition of some rocks

Increasing the Earth's temperature.



### **Water**





#### Similarity

• They're used to generate electricity.



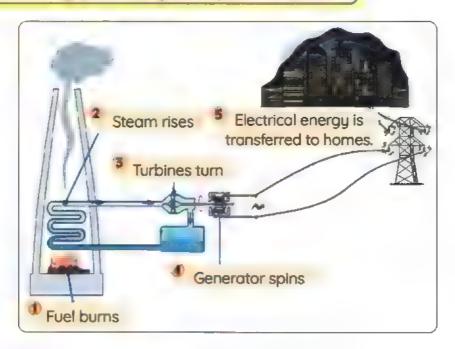
#### Differences

- Renewable resource of energy
- Nonrenewable resource of energy
- We must use water carefully and not waste or pollute it.
- If we waste or pollute water, it may not be replaced as quickly as we need.

#### Formation of oil:

- Marine organisms died millions of years ago.
- Layers of sediments and rocks cover the remains.
- 3 Over time, those remains are converted into oil due to extreme heat and pressure.

### Generating Electricity Using Fossil Fuel





#### Fuel burns

When fuel (coal, oil, or natural gas) burns, it releases thermal energy.



### Steam rises

This thermal energy is used to heat water to produce steam.



#### **Turbines turn**

The steam is directed to tubes to turn turbines.



#### **Generator spins**

 Turbines make the generator spin and convert kinetic energy into electrical energy.



## Electrical energy is transferred to homes

Electrical energy travels through cables to homes and factories.

## How do we conserve electricity



- Turning off the lights we don't need.
- 2 Unpluging electrical appliances after using them.
- Setting a regular electricity-free time.

# 2 Definitions of Concept 2

Gasoline pointer	It's a device that helps the driver of the car check the amount of fuel.
Gasoline	It's a liquid that forms from oil and is used in moving cars.
Fuel	It's a material that releases thermal energy when it is burned.
Chemical energy	It's a kind of energy stored in fuel.
Thermal energy	It's the energy released from burning fossil fuel.
Renewable resources	<ul> <li>They are natural resources that are can be renewed after a short time of being used.</li> <li>They are energy resources that include solar energy and hydroelectricity.</li> </ul>
Nonrenewable resources	<ul> <li>They are energy resources that are used at a faster rate than they can be replaced.</li> <li>They're energy resources that include all kinds of fossil fuel.</li> </ul>
Biofuel	It is a type of fuel that is made from the living organisms that can be planted.
Fossil Fuel	<ul> <li>It is a type of fuel that is extracted from deep ground under the Earth's surface.</li> <li>It is a type of fuel that is formed by the decomposition of old, dead organisms buried under the ground.</li> </ul>
Oil and Natural gas	They are types of fossil fuel produced the decay of dead marine organisms (sea creatures).
Coul	It is a type of fossil fuel produced from the decomposition of ancient dead plants and trees.

#### - Final Revision

Extreme heat and pressure	They're the factors needed for the formation of fossil fuel.
Charcoal	It is a kind of biofuel that is made from the wood of trees.
Liquid fuel	It is a kind of biofuel that is made from corn, grass and wood chips.
Wood	It is the oldest fuel that ancient people used.
Deforestation	It's a phenomenon that results from cutting trees at a faster rate to get wood.
Generator	It's a device that changes kinetic energy into electrical energy in electric power stations.
Carbon dioxide gas	It's a gas that causes global warming and acidic rains.
Global warming	It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air.
Acid rain	It is formed when carbon dioxide mixes with water in the air, and it causes the decomposition of some rocks and the death of trees.

# Give Reasons for. Concept 2

- Gasoline is very important for cars to move.
  - Because gasoline burns inside the car engine, allowing the engine to rotate the wheels.
- The gasoline pointer is very useful for drivers.
  - To help the driver check the amount of gasoline (fuel) in the car.
- Coal and wood are very important for warming houses.
  - •Because they produce thermal energy when burned.

- Biofuel is a renewable resource of energy.
  - Because it is renewed with the continuous growth of plants.
- 5 Fossil fuel is a nonrenewable resource of energy
  - \*Because it starts to run out as we use it and can't be renewed easily.
- 6. Biofuel has a negative effect on the environment
  - To get biofuel, it requires cutting down trees, which may lead to deforestation.
- Fossil fuel has a negative effection the environment.
  - Because burning fossil fuels produces carbon dioxide, which increases air pollution and causes global warming.
- 8 Using coal or natural gas in electric power static is
  - To get the thermal energy needed to heat water and produce steam.
- 9 It is necessary to conserve fossil fuel.
  - To reduce air pollution.
- 10 Walking or biking is better than driving cars.
  - \*To reduce the amount of burning fossil fuel and reduce air pollution.
- Water is a renewable resource of energy
  - \*Because it is available and hasn't run out yet.
- 12 We must use water carefully and not waite or place in
  - Because if we waste or pollute water, we can't replace it as quickly as we need.
- 13: We should conserve electricity.
  - To avoid burning more fossil fuels and air pollution.
- 14 Generators riay an important role in the color of each inco
  - Because generators convert kinetic energy into electrical energy.
- **15** Turbines a cilian por antini e iri ele e
  - Because the kinetic energy of turbines is used to spin generators.
- 16 Engineers / Jakin inp / n. n.
  - \*To reduce the burning of fossil fuel of normal vehicles and reduce air pollution.

#### - Final Revision

- 77 Smog has a bad impact on the human's respiratory system.
  - Because smog consists of small harmful particles that irritate the lungs and cause damage to lung tissues.
- 18 Formation of acid rain.
  - Because carbon dioxide gas combines with water in the air to form acid rain.
- Acid rain has many negative effects on the environment.

#### Because acid rain may cause:

- 1- The death of trees. 2- The death of fish.
- 3- The decomposition of some rocks, including bricks of buildings.

# 4 What Happens if Concept 2

- The car's engine runs out of fuel
  - The car will stop.
- We cut down trees at a finite or a second of the second
  - It leads to deforestation.
- The remains of plant in the remains of plants.
  - Coal will be formed.
- The remaining of section is a final result, and a section is a final result.
  - Oll or natural gas will be formed.
- 5 We waste water or pollute it
  - We may not be able to replace it as quickly as we need.
- Generators are turned on
  - Generators change kinetic energy into electrical energy.
- A person is exposed to smog
  - Smog will irritate his/her eyes and lungs.
- 🔞 Carbondo, 5 jr. 💎 👚 1 nor fore
  - Global warming happens because Earth's temperature increases slowly.

# 5 Revision on Concept 2

Choose the	e correct answ	er:	
All the follow	ving are found d	eeply under the E	arth's surface, except
a.coal	b.oil	c.natural gas	<b>d</b> .green plants
@er	nergy is stored in:	side coal.	
a. Thermal	<b>b</b> .Solar	c. Chemical	d. Electrical
(3) If we are going	ng on a long roa	d trip, we must che	eck the
a.seats			d.gasoline pointer
Fuel is used e	as a source of	energy.	
a. thermal	<b>b.</b> chemical	<b>c.</b> light	<b>d</b> .solar
All the follow	ing are extracted	from undergroun	d, except
a.coal		c. petroleum	
6is	a renewable reso	ource of energy.	
a. Oil	<b>b.</b> Coal	<b>c</b> .Gasoline	d.Com
Coal is forme	d underground o	lue to the decomp	osition of dead
a. plants	<b>b</b> .animals	c. humans	d.birds
(i) tak	kes millions of ye	ars to be formed.	
a. Coal	b.Charcoal	c. Wood	d.Com
One of the di	sadvantages of a	overusing biofuel is	S manufacture to the temporal temporal manufacture and the second
<ul><li>overfishing</li></ul>	<b>b.</b> wildfire	c. deforestation	d.acid rain
<b>®</b> Both water a	nd oil		
a. are renewe	able resources	b. are nonrenewo	ible resources
c. have the so	ame structure	d.can be used to	generate electricity
By heating we	ater, it turns into	A MANUSCONO 9	
a. steam	<b>b</b> .ice	c. electricity	<b>d</b> fuel

	12 The steam proc	duced in the el	ectric power:	station is directed in	nto tuk	oes
	to turn the					
	a. turbines	b. motors	c. mills	d. lamps		
	13 Electrical energ	y travels thro	ugh	to homes and fa	ctories	S.
	a. tubes	b. motors	c. cables	d. fans		
	and	are	included in fo	ossil fuel formation	).	
	Heating - co	oling	b. Burying	- cooling		
	Decaying - h	eating	d. Decayin	g - growth		
	15 Smog damage	s the tissues o	of the	system.		
	digestive	b. circulator	ry <b>c.</b> respirato	ory d. nervous	·	
	16 Cars' smog cau	ises irritation	of humans'	A M		
	small intestin	es <b>b.</b> brains	c. hearts	d. eyes		
	17 Acld rain is form	ned when	comb	ines with water.		
	a. oxygen		b. carbon o	dioxide		
	c. hydrogen		d. nitrogen			
	18 Using	to produce e	electrical ene	rgy is expensive.		
	solar energy	b. oil	c. natural g	gas d coal		
	19 Burning fossil fo	uel causes all	the following	, except		
	pollution	b. acid rain	c. global w	arming 📑 deforest	ation	
	Put (√) or (X):					
1	1 As the speed of	f the car incre	ases, the am	ount of the used fu	iel	-
	decreases.				(	)
	2 We cannot drive	e a car if the g	asoline inside	the fuel tank runs of	out. (	)
	3 Thermal energ	y is produced	by burning o	piece of wood.	(	)
	4 Cars, buses, an	d bicycles nee	ed gasoline to	o run on roads.	(	)
	5 Coal is the olde	st fuel that ha	s been used o	all over the world b	y anci:	ent
	people.				(	)
	6 Fossil fuel is mo	ade from living	g things that	can be grown.	(	)
	7 The consumption	on rate of coo	l is slower the	an its formation ra	te. (	)
	8 Water may not	be replaced	as quickly as	we need.	(	)

- Final Revision

Concept (2): Abou	t Fuel	0-
Some plants are used to make liquid biofuel.	(	)
10 The movement of a generator in an electric power station pro	) oduc	es
potential energy.	(	)
Turbines are operated by steam in electric power stations.	(	)
12 Using energy-saving light bulbs conserves electricity.	(	)
On cooling water, it turns into steam in electric power stations.	(	)
14 Pesticides cause soil and water pollution.	(	)
When the burning of fossil fuel increases, the temperature or	ı Ear	rth
decreases.	(	)
16 Mixing water with oxygen gas produces acid rain.	(	)
The amount of fossil fuel on Earth is unlimited.	(	)
Write the scientific term:		
1 It's a device that helps the car driver check the amount of fuel.		
		)
It's a liquid fossil fuel that burns inside the car engine.	n 14444 <b>n-mem-e</b>	)
(i) It's a kind of energy that is stored in fuel.	A BANKSON TA	()
It's a form of energy produced by burning fuel. (	e(+,) <del>ereseres</del>	)
It's a material that releases thermal energy on burning. (	r '' et 1979/91-17- 1	. )
It is a natural resource that is used faster than it can be replace		
(		)
It is a natural resource that can be replaced soon after it is use		
It is the fuel that is made from living organisms that can be pla		
It is the fuel that is extracted from deep ground under the		
surface.		
It's a kind of fossil fuel that is produced from the decomposit	tion	of
dead marine organisms. (		)

11 It's a kind of fossil fuel that is produced from the decomposition of

it's a kind of biofuel that is made of the wood of trees. (

dead plants.

Final Revision	
lt's a kind of biofuel that is made of corn and gro	ass. ()
lt's the energy produced by the generator.	
15 It's a device that operates generators.	
It's a device in the electric power stations that ch	
energy Into electrical energy.	( = = = = = = = = = = = = = = = = =
It is a phenomenon in which the Earth's tempera	ature increases when
carbon dioxide gas increases in the air.	475haanse 11 111-01-0177755 = 1
It is a phenomenon that causes the decomposition	on of some rocks and
the death of trees.	
It's a gas that causes global warming and acid r	rain. ()
Complete the following sentences:	
Some forms of fuel, such as and	can be used
in warming houses.  ② Extreme and are the factors.	ctors needed for the
formation of fossil fuel underground.	clors riceded for the
Water is considered a resource of the state of	of energy, while oil is
a resource of energy.	
Turbines in electric power stations are turned by	, and the
produce kinetic energy to run the	
stations.	
The electric generator changes the	energy into
energy.	
To avoid air pollution, we must use	resources of energy.
Smog causes pollution.	
Pesticides causes and p	pollution.
O	ween the brackets
Complete the following using the words bet	
(wood - deforestation - undergroun	
Ancient people used in cooking food	
Gasoline is made from, while coal is ext	
© Cutting trees with a fast rate causes	•



# Choose from column (A) what suits it in column (B):

10	
	- 4
т.	4

Column (A)	Column (B)
Chemical energy	a. is generated in electric power stations.
2 Kinetic energy	b. is stored inside fuel.
3 Thermal energy	c. is produced when the car wheels rotate.
Electrical energy	d. is produced when burning a piece of coal.
Electrical energy	

4 600		
100		
113	14+101211114+1+1-1	









Column (A)	Column (B)
The Sun	a. takes a very long time to be formed.
2 Fossil fuel	b. takes a short time to be formed.
3 Biofuel	c. is the primary source of all kinds of energy.

Column (B)
a, was used by ancient people.
b, is made from grass, corn, and wood chips
c. is a fuel that is made from oil.
d. is made from wood.

Column (A)	Column (B)	
(1) Generators	a. produces thermal energy.	
2 Turbines	b. produce electrical energy.	
Burning fuel	c. is produced from heating water.	
<b></b> Steam	d. produce kinetic energy.	

### - Final Revision

Wood - Oil - Corn - Charcoal	(
Sun – Wind – Water – Coal	(
Coal – Charcoal – Natural gas – Oil	(
Give reasons for:	
The fuel (gasoline) pointer is very useful	for drivers.
Fossil fuel is considered a nonrenewable	resource of energy
Biofuel is considered a renewable resour	ce of energy.
Generators play an important role in elec	tric power stations.
The fossil fuel amount on Earth is limited.	* destruction ( ) * destructio
Engineers work on improving solar vehic	les.
What happens if"	
We burn a piece of coal?	
We cut down trees at a faster rate than t	hey can grow?
Oil is burned inside electric power station	s?
Water is heated in electric power stations	s?
Acid rain falls on buildings?	to a significant and a second of the second

# Renewable Energy Resources Concept ( | K

# Summary of Concept 3

Renewable resources of energu

They are natural resources that are replaced (renewed) at a faster rate than they are consumed.

First: Wind Energy

In the past, people needed machines to make their lives easier.

## Windmill







### Way of Working

- 1) The wind moves the mill's blades.
- 2 The kinetic energy is transferred to the internal parts of the mill.
- 11 The water moves the mill's blades.
- 2 The kinetic energy is transferred to the internal parts of the mill.

#### **importance**

• They are used to crush (grind) grains and make flour.



#### **Advantages**

- Low cost
- Renewable energy resources

#### Disadvantages



- Sometimes the wind doesn't blow. so it can't do its main job.
- · Sometimes, the water supply may dry up, so it can't do its main job.

#### Modern turbines are used now instead of old windmills.

#### Modern Wind Turbines



#### Old Windmill



#### **Function**

Generating electricity

· Grinding the grains to make flour

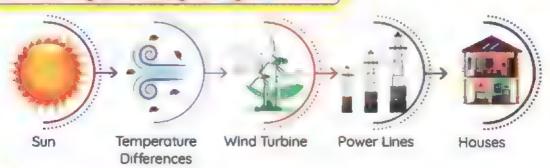
#### **Differences**

- They are taller than windmills.
- They have fewer blades than windmills.
- The blades have no openings.
- . They are shorter than wind turbines.
- They have more blades than wind turbines.
- The blades have openings.

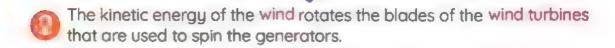
#### Similarity

They depend on the kinetic energy of the wind to operate.

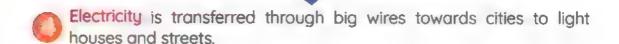
### Generating Electricity Using the Wind











## Second: Water Energy

#### Hydroelectricity: (Hydroelectric energy)

It is a type of electrical energy generated by water turbines in dams.



## How can water be used to generate electricity



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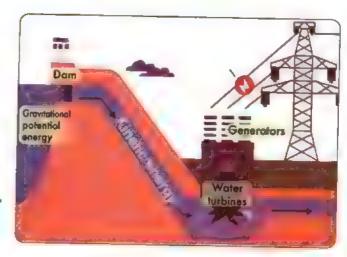
A hydroelectric dam holds back the flow of water to increase its potential energy.



When the water is released, it passes through the blades of turbines, so they rotate.



Turbines operate the generators, so kinetic energy is converted into electrical energy.



Electricity is transferred to cities through long electric wires.

P.O.C	Wind Turbines	Water Turbines
Differences	<ul> <li>They are placed in windy places.</li> </ul>	They are placed in places     where dams are built on rivers.
Similarities	<ol> <li>Both of them are renewable resources.</li> <li>Both of them use kinetic energy to turn turbines.</li> <li>Both of them are used to generate electricity.</li> </ol>	

### Third: Solar Energy

Sun

It is the main source of all kinds of energy on Earth.

The Sun provides us with light and heat.

The sunrays are called radiant energy (radiation).

The energy received from the Sun is called solar energy.

## **Uses of Solar Energy**

· We can use solar energy as a source of thermal energy

#### Importance:

•They help farmers plant the crops that need warm climates.

How does it work?



**Greenhouses** 

- A greenhouse allows the entry of light and radiant energy from the Sun.
- 2 Radiant energy changes to thermal energy inside it.
- 3 Thermal energy warms the greenhouse from inside.

# **Warming**



- a Warming Ourselves
- ·When exposing yourself to the Sun, you feel warm.
- Warming Houses
- •By placing large windows on the wall that faces the sun.

# © Concave mirrors



- They collect and focus the sunlight to heat a metal pot and cook the food inside.
- Solar water heater



Structure: It contains panels made of black pipes.

Location: It can be placed on the roof of a house.

#### How does it work?

- 1 As water passes through the pipes, it heats up.
- <sup>2</sup> Water can then be stored in a hot water tank to be used later.

#### Solar Panels

#### Structure

They consist of a large number of small solar cells.

#### Idea

 Solar cells capture the radiant energy coming from the Sun and turn it directly into electricity.

#### Size

- · Very small to supply only one light bulb with energy
- Very large to supply buildings or cities with energy

#### Most solar panels are used to generate electricity to:

- 1 Light houses and streets.
- Uses 2 Operate electric devices.
  - 3 Recharge batteries of solar-cell calculators.
  - 4 Power irrigation equipment in some villages.









# 2 Definitions of Concept 3

Renewable energy resources	They are energy resources that include wind energy and water energy.
Old windmill	It's a machine that used the kinetic energy of the wind to grind grains to make flour.
Watermill	It's a machine that used the kinetic energy of the water to grind grains to make flour.
Modern wind turbines	They use the kinetic energy of the wind to generate electricity.
Solar panels	They are composed of many solar cells.  They absorb solar energy (sunlight) and convert it Into electrical energy.
Greenhouse	It's a structure that helps farmers to plant crops that need warm climate.
Concave mirror	It's a mirror used to direct and focus sunrays toward the metallic pot used to cook food inside it.
Generator	It's a device that turns kinetic energy into electrical energy.
Dam	It's a building on the river that controls the water flow and increases its potential energy.
Hydroelectricity	It's a type of electrical energy generated by water turbines in dams and waterfalls.
Evaporation	It's a process in which water changes into water vapor.
Condensation	It's a process in which water vapor changes into water.

### Give Reasons for Concept 3

- People use machines.
  - · To make their life easier and do tasks faster.
- Solar energy is a renewable resource of energy.
  - Because solar energy is the energy that will not run out as we use it.
- People used windmills and watermills 400 years ago.
  - To grind grains to make flour.
- People now use modern wind turbines.
  - To generate the electricity needed to light houses and operate different devices.
- Using windmills and watermills has a lot of advantages.
  - Due to their low cost and because they depend on renewable resources.
- Using windmills and watermills has great disadvantages.
  - Sometimes the wind does not blow or the water supply may dry up.
- We feel the warmth of the Sun at night.
  - Because the atmosphere, water and soil absorb heat energy from the Sun.
- Greenhouses help farmers in the agricultural field.
  - Because they help farmers in planting crops that need warm weather.
- We place large windows on the wall that faces the Sun.
  - To enable the energy of the Sun to warm the house.
- Concave mirrors are used in cooking.
  - To direct the sunrays towards the cooking pans to cook food inside them.
- The panels made of black pipes can be placed on the houses' roofs.
  - To heat water, then store it in a hot water tank.
- Solar panels are used in generating electricity for lighting houses and streets.
  - Because they convert solar energy into electrical energy.
- The Sun is the main source in generating electricity from windmills.
  - Because the Sun warms the Earth and the wind. Different parts of the world get different amounts of solar energy. This causes the blowing wind to rotate the blades of the windmills.

#### o Final Revision

- Dams are built on rivers.
  - To control the flow of water and increase the gravitational potential energy of water to generate electricity.
- Water returns to rivers after flowing.
  - Because water evaporates, then it condensates in the form of clouds and returns to the rivers in the form of rain.
- Renewable resources of energy are considered clean resources of energy.
  - Because they don't need burning fossil fuel to generate electricity, so they don't pollute the environment.
- There are conditions required for wind turbines to work with high efficiency.
  - · Because they should exist in windy regions.

# 4 What Happens if Concept 3

- ill Wind doesn't blow in an area that contains many wind turbines.
  - . The wind turbines will not move, so they can't generate electricity.
- Water falls on the blades of water turbines.
  - · The blades will rotate, so they can generate electricity.
- The force of wind increases in an area that contains many wind turbines.
  - The blades rotate faster, and the efficiency of the wind turbines increases.
- Sunlight falls on a greenhouse.
  - Radiant energy changes to thermal energy inside the greenhouse which warms the greenhouse from inside.
- Sunlight falls on a concave mirror.
  - The concave mirror focuses the sunlight on the cooking pot to cook food inside it.
- Sunlight falls on a solar-cell calculator.
  - It changes solar energy to electrical energy to charge its batteries.
- Water is released from a dam.
  - The gravitational energy of water changes into kinetic energy to rotate the water turbines and generate electricity.

# 5 Revision on Concept 3

	Choose the co	rrect answer:		
1	All the following	are considered ren	ewable resources	of energy, except
	SAME SERVICES SAME S			
	a. wind	b. coal	c. the Sun	<b>d</b> . water
2	The main function	on ofis grid	nding the grains a	nd making flour.
	a. modern turbii	nes	b. solar panels	
	c. dams		d. watermills	
<b>(3</b>	Both modern wir	nd turbines and old	d windmills are sim	ilar in their
	a. blades numbe	er	b. ways of worki	ng
	c. heights		d. blades shape	
4	Modern turbines	are than a	old windmills.	
	a. longer	b. shorter	c. heavier	d. slower
5	The source of all	energies on Earth	n is	
	a. wind	b. the moon	c. the Sun	d. water
6	In winter, greenh	ouses help farme	rs grow plants tha	t need
	a. warm weathe	r	<b>b.</b> cold weather	
	c. less water		d. less sunlight	
7	Solar panels can	be used operate	all the following, e	xcept
	a. a calculator		b. a gas oven	
	c. irrigation equi	pments	d. street lights	
8		y of the Sun cause		
	a. chemical		c. electrical	
9		rom wind turbine	s is transmitted i	into houses and
	factories through			
	a. the wind		c. generators	d. wires
10	-	wer is produced u	_	
	a. air	b. water		d. plants
11		ores great		
		b. potential		d. light
12		e for the electric for		
	a. wind	b. water	c. heat	d. electricity

Windmills can do their job all the time, as the wind never stop	s blowin
	(
When the kinetic energy of the wind increases, the windm spin faster.	nill blade (
Both modern wind turbines and old windmills are used to electricity.	generat
Electricity generated by wind turbines is transmitted through	the wine
	(
The power source for the electric fan is wind.	(
6 Wind turbines convert kinetic energy into electrical energy.	(
7 We use solar energy to preserve food.	(
<b>8</b> We feel the warmth of the Sun during the day only.	(
9 A solar cell consists of a large number of small solar panels	i. (
O A calculator's output energy is solar energy.	(
1 Small solar panels may be able to light buildings.	(
2 The flow of water in dams can be controlled to generate electr	ricity.(
3 Electricity generated from water is called hydroelectricity.	(
4 Rivers store kinetic energy.	(
5 The electricity produced by water is known as electromagnet	tic energ
	(
Write the scientific term:	
They are energy resources that include wind energy and wat	er energ

4 It's a device that consists of black pipes used to heat water.(\_\_\_\_\_

3 It's a device that the wind rotates its blades to generate electricity.

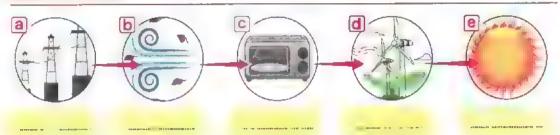
## Concept (3): Renewable Energy Resources o-

It's a structure on the rive the potential energy of	ver that controls the flow of water and increases f water.
_	energy generated by water turbines in dams.
Complete the follow	
When the wind turbine energy.	es rotate,energy is converted into
	novements produceenergy, which es to generateenergy.
	in modern wind turbines is than in
	gy in cooking using concave, which onto the metal pots to heat them.
A STORY	ers grow crops that need warm weather.
	e air to and the wind to
	to cities through
Choose from colum	n (A) what suits it in column (B);
<u> </u>	n (A) what suits it in column (B):  Column (B)
Choose from column (A)  Greenhouses	Column (B)
Column (A)	
Column (A)  Greenhouses	Column (B) a. are used in heating water.
Column (A)  1 Greenhouses  2 Concave mirrors	column (B) a.are used in heating water. b.are used in planting some kinds of crops.
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes	column (B) a.are used in heating water. b.are used in planting some kinds of crops.
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes	column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food.
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes  Study the following fig	column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food.
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes  Study the following fig	Column (B)  a. are used in heating water.  b. are used in planting some kinds of crops.  c. are used in cooking food.  gures, then complete the sentences below:  IIII  Ire (1) Figure (2)
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes  1 Study the following fig  Figure () is used to	Column (B)  a. are used in heating water.  b. are used in planting some kinds of crops.  c. are used in cooking food.  gures, then complete the sentences below:  IIII  Ire (1) Figure (2)
Column (A)  1 Greenhouses 2 Concave mirrors 3 Panels of black pipes  1 Study the following fig  Figure () is used to	Column (B)  a. are used in heating water.  b. are used in planting some kinds of crops.  c. are used in cooking food.  gures, then complete the sentences below:  III  Ire (1) Figure (2)  grind grains.  j is shorter than the machine in figure ().

#### → Final Revision



# To generate electricity, arrange the following figures from start to end:

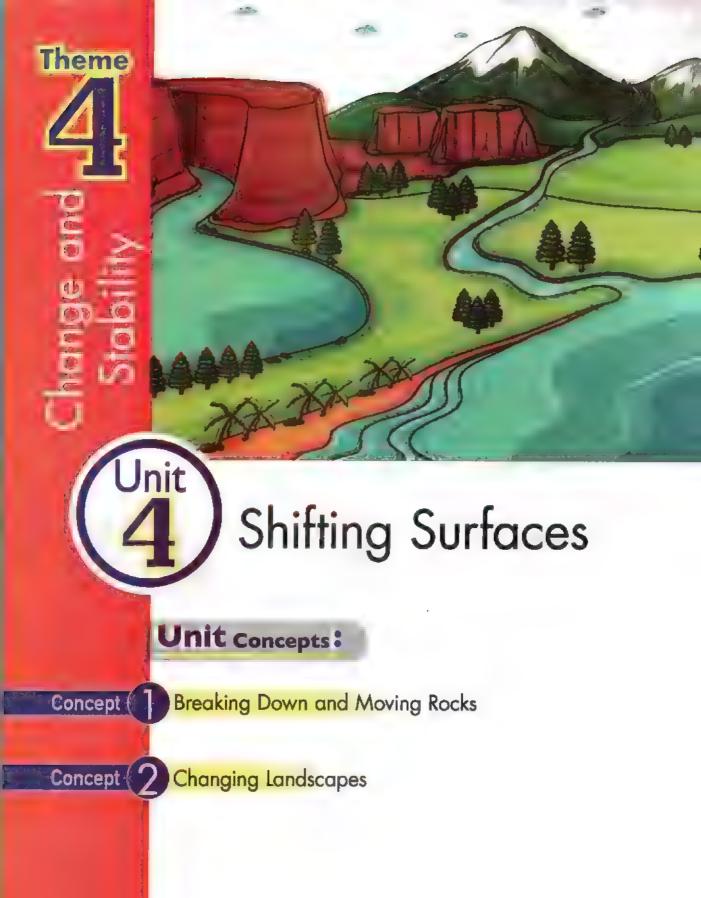


# Give reasons for:

- People used windmills and watermills 400 years ago.
- 2 People now use modern wind turbines.
- 3 You feel the warmth of the Sun at night.
- Greenhouses are very important to farmers.
- 6 Generators have an important role in electric power stations.
- 6 Dams are built on rivers.

#### What happens if?

- Wind doesn't blow in an area that has wind turbines?
- 2 The kinetic energy that is applied on the wind turbines increases?
- 3. The water of dams becomes free?



# Concept

# **Breaking Down and Moving Rocks**

# 1 Summary of Concept 1

The Earth's surface always changes.

#### Sandcastles

- They have steep parts and sloping sides at the bottoms.
- They disappear after a short time due to the erosion of the sea waves.

(A rapid change)



#### Coastal rocks

- They have steep parts and sloping sides at the bottoms.
- There may be a little difference as breaking off some parts by wind or water after many years.

(A slow change)



#### Canyons

- They have steep needle-like parts with slopes at the sides.
- They take millions of years to be formed.

(A slow change)



has steep needle-like parts

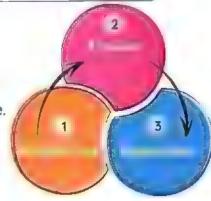
is created by water

is formed due to slow changes

has inclined sides at bottom

## Shaping the Earth's surface

- Wind, water, and weather conditions are the factors that cause changes of the Earth's surface.
- Earth's surface changes through three processes which are weathering, erosion, and deposition.





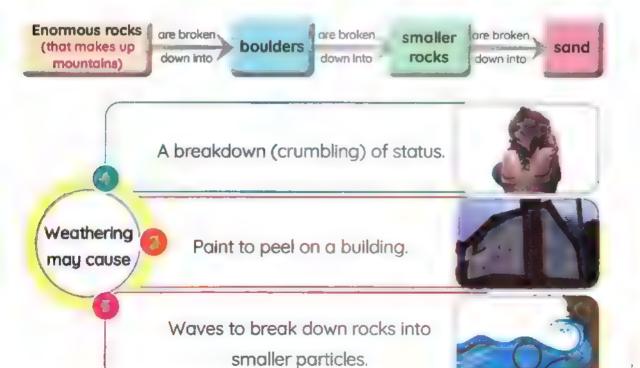




The changing of the Earth's surface begins with the weathering process



Is the process of breaking down rocks into small (tiny) particles.



### Types of Weathering

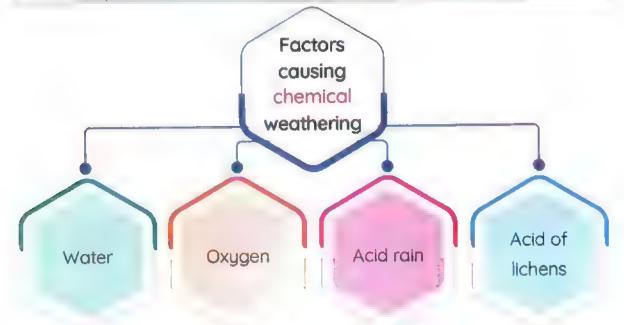
#### P.O.C

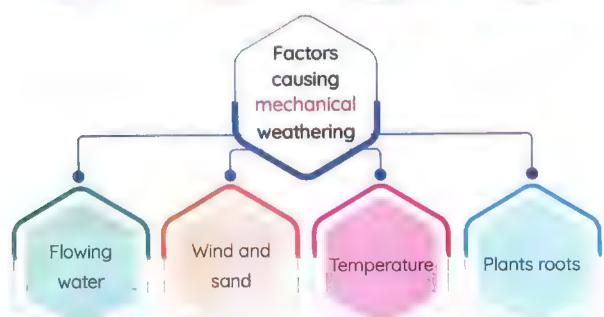
#### **Chemical Weathering**

### **Mechanical Weathering**

#### Definition

 The process of breaking rocks down with a change in their structure (nature) due to chemical reactions.  The process of breaking rocks down without any change in their structure (nature) due to physical factors.







#### Water

 Water dissolves minerals in the rocks, and then those dissolved minerals recombine again, forming new shapes, as in limestone **Factors** caves.

## Oxygen

Oxygen in the air reacts with

the iron in some rocks, forming red-colored rust that causes rocks to be weak and easily broken. causing



#### Acid rain

Acid rain falls on rocks.

 These acids dissolve minerals in the rocks, so they become weaker and break down easily.

## Acid of lichens

chemical

weathering

**Factors** 

causing mechanical

weathering

 Lichens produce acids on rocks.

 These acids dissolve minerals in the rocks, so they become weaker and break down easilu.



### Flowing water

- Flowing water carrying some sand and gravel causes:
- a Scouring edges off boulders.
- **b** Breaking off large pieces of tumbled rocks due to collision with each other

#### Plants roots



- a Plant roots grow inside the cracks of rocks.
- **b** Cracks become wider.
  - Rocks are broken down.



#### Wind and sand

Wind rushes sand on the rock surface.

- Friction occurs between sand and rocks.
- This causes the smoothing of rocks and the breaking down of them.

### Temperature



- a Water flows in the tinu cracks in the rocks.
- b Water expands when it turns into ice, then melts.
- By repeated melting and freezing of water, cracks in rocks become wider, causing the rocks to be broken down.





**Factors** 

causing

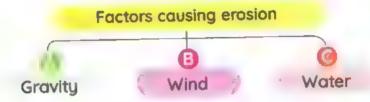
erosion

It is the process of moving sediments from one place to another.

I Had kin



Note: Sediments are weathered sand, soil, and small rocks.



### Gravity

Gravity pulls rocks down mountainsides.



#### Wind

- The wind carries grains of sand from one place to another, where:
  - Strong wind and hurricanes blow sand for long distances.
  - Gentle wind blows sand grains for short distances.



#### Water

- Rivers and floods erode rocks and soil from their banks.
- Waves pull sand away from beaches.
- Rain washes the soil on hilly farmland downhills.



# **1 Deposition:**

### Deposition

It is the process of laying down eroded sediments in a new place.

## Deposition by wind:

- As the wind blows, it picks up sand.
- Wind carries sand to another place.
- When the wind stops blowing, sand is deposited.

#### This forms:

- Small sand dunes on beaches.
- b Large sand dunes in desert.



## Deposition by water:

000

- A river carries sediment eroded from its banks.
- When the river carrying sediments meets a sea, it deposits

them.

#### This forms:

• A delta, such as Nile Delta



# 2 Definitions of Concept 1

Weathering	It is the process of breaking down rocks into smaller pieces.
Mechanical weathering	It is a type of weathering that breaks off rocks without changing its matter(structure).
Chemical weathering	It is a type of weathering that leads to the formation of a different material.
Lichens	They are tiny-like plants that live on rocks and produce acid on them, causing them to break down.
Oxygen gas	It is the gas that reacts with iron in rocks, forming a red- colored rust on some rocks.
Plant's roots	They are a part of the plant that grows in rocks' cracks, causing them to be broken.
Acid rain	It is a natural phenomenon that has the same effect as lichens on rocks.
Erosion	It is the process of moving sediment from one place to another.
Deposition	It is the process of settling sediments in a new place after they have been moved by erosion.
Gravity	It is an eroding factor that pulls the rocks down mountainsides.
River	It is an eroding factor that moves rocks from their banks downstream.
Sediments	They are pieces of weathered rocks that are moved by gravity, wind, water, or other factors.

# Give Reasons for. Concept 1

- 1 The Earth's surface is always changing.
  - Because of many factors, such as wind, water, and weather.
- 2 Wind is the main factor changing the Earth's surface.
  - Because it can break down rocks and move small rocks to another place.
- 3 Waves are from factors which can change landforms.
  - Because waves can move small parts of sand from one place to another.
- 4 Changes to the Earth's surface are different in the time of happening.
  - Because some changes of the Earth surface happen quickly, such as the disappearance of sandcastles, while others take a very long time, such as formation of canyons.
- 5 The shape of coastal rocks changes after many years.
  - Because some parts of them may be broken off by water or wind.
- 6 The main source of soil is big rocks.
  - Because when the weathering process occurs, the big rocks break down into tiny rocks, then into pebbles or grains of sand.
- 7 Oxygen gas has a bad effect on rocks.
  - Because oxygen gas can react with iron in rocks forming red-colored rust which makes the rock weaker and breaks down easily.
- 8 Plant roots may have a bad impact on rocks.
  - Because as plant roots grow inside rocks, the cracks in the rocks become wider, so the rocks break down.
- 9 Lichens have a bad impact on rocks.
  - Because they produce acids as they grow on rocks that make the rock weaker and break off easily.
- 10 There are some similarities between the effects of lichens and acid rain on rocks.
  - Both of them can dissolve the rocks or changing their nature.
- 11 Sand and wind team up to wear down large rocks.
  - Because wind rushes sand on the surface of the rocks, it smoothes and breaks them down.
- 12 It is hard to see weathering in action (in most cases).
  - · Because it takes a long period of time to happen.

#### Final Revision

- Chemical weathering causes a greater change to rocks than mechanical weathering.
  - Because chemical weathering forms completely new, different matter, while mechanical weathering breaks down rocks only.
- **M** Sometimes you can see erosion happening.
  - Because sometimes we can see flash floods, hurricanes, or landslides.
- **B** Gravity is one of the eroding factors.
  - Because gravity pulls rocks down mountainsides.
- **Erosion** and deposition are linked processes.
  - Because eroded rocks must be deposited over time.
- The formation of a delta.
  - · As a result of the deposition process when a river meets a sea.

# 4 What Happens if Concept 1

- The waves hit a sandcastle?
  - · The sandcastle will be gone (disappeared).
- Water runs over rocks?
  - · Water will dissolve some minerals in rocks.
- Oxugen in our atmosphere reacts with Iron in the rock?
  - · A red-colored rust will be formed, so rocks are broken down more easily.
- The continuous melting and freezing cycle of water inside rocks cracks?
  - Water expands, causing the cracks in the rocks to become wider, so the rocks break off.
- Acid rain falls on rocks?
  - Acid rain will dissolve the minerals in rocks, so they become weaker and break down easilu.
- Lichens grow on the rocks?
  - · They produce acids that can break off rocks.
- A plant's root grows inside rocks?
  - The cracks become wider so rocks break down easily.
- Rain falls on a hilly farmland?
  - Rain will carry the weathered rocks and soil on farmlands.
- Wind stops blowing (concerning the process happening to sand)?
  - The deposition process will happen.
- MA river carrying sediments meets a sea?
  - The deposition process happens and a delta may be formed.

# 5 Revision on Concept 1

Choose the correct answer:	
Steep valleys formed due to flowing	ng water erosion are called
a. hills b. sand dunes	c. canyons d. deltas
2. A canyon may take to	be formed.
a. minutes b. hours	c. days d. years
All the following are reasons	for chemical weathering, except
as many programming to the contract of the con	
a. water b. plant roots	c. acid rain a oxygen gas
may cause chemical or	r mechanical weathering.
a. Lichens b. Oxygen	c. Water d. Rocks
	represents mechanical weathering?
a. Red-colored rust on rocks	
c. Roots grow inside rocks.	
6 Sand is formed due to the breaking	
a. wood b. plastic	_
2 Limestone caves are formed due	
a. dissolved minerals	
c. red-colored rust	
is the process by which sec	
a. Deposition b. Erosion	
an example of	recombine with new substances is
a. mechanical weathering	b. weathering by wind
c. chemical weathering	c. erosion
All the following are processes that	
An the lonewing are processes the	it change the Earth's 30 race, except
	c. weathering d. deposition
1 Lichens produce that di	
a, oxygen b. rain	c. water d. acids
33	

#### - Final Revision 12 The process of breaking down rocks on the Earth's surface is called b. weathering c. decomposition d. deposition g. erosion 13 The force of \_\_\_\_\_ pulls rocks from the top of the mountain to its bottom. d. gravity a, river water b, seawater c. rainwater 14 \_\_\_\_\_ erode(s) rocks and soil from their banks. d. Gravitu b. Mountains c. Rainwater a. Rivers 15 When a river carrying sediments meets a sea, a \_\_\_\_\_ is formed. a. sand bar b. sand dune c. delta d. sand pile 16 Gentle wind can carry sand arains for \_\_\_\_ distances. a. short b. long c. huge d. veru long Put $(\checkmark)$ or (x): 1 The Earth's surface changes from time to time. ) 2 All changes to the Earth's surface take hundreds of years. 3 Canyons take millions of years to be formed. The Earth's surface never changes. 5 The deposition process takes place before the erosion process. ( 6 We can see weathering in action everywhere around us. 7 Plant roots help in the formation of rocks. 8 Rocks become stronger when iron found in them rusts. 9 Wind is one of the agents that cause weathering. 10 Chemical weathering causes greater changes to rocks than mechanical weathering. 11. Sometimes you can see erosion happening. 12 The deposition process never changes the shape of the Earth's surface. 13 The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of the wind. 14 Floods are one of the factors that cause water erosion.

15 The erosion process is usually followed by the weathering process. (

Wr	ite the scientific term:	
1 Th	ey are deep valleys carved by the flowing water.	()
1 <b>2</b> It's	the process of moving rocks from one place to anoth	er. ()
3 It's	the process of laying sediments down.	()
4 It's	the kind of weathering that changes the structure of	and color of
roc	cks.	()
5 Th	ey are tiny, like plants, that live on rocks and produc	ce acids on
the	em.	(
6 It is	s the gas that causes the red-colored rust on some	rocks. ()
7 It is	s a type of weathering that occurs in rocks and lea	ads to the
	mation of a completely different material.	()
	s a type of weathering that breaks rocks down wit	thout changing
	eir matter.	(
9 It is	s an eroding factor that pulls rocks down mountains	
00 14.1		(
10 It is	an eroding factor that moves rocks from their bank	
11 It ic	the process that lave sand down when the wind st	
11 11 15	s the process that lays sand down when the wind st	ops blowing.
12 it is	a landform of deposited sediments formed when a	,
as		()
		,,
Cor	mplete the following using the words between	the brackets:
(M	lechanical - A <mark>cid rain - ch</mark> emical - oxygen - Acids - iro	n – plant roots)
1 The	e melting and freezing cycles of water have the s	same effect as
	, as they make the cracks in the rocks wid	der.
2	produced by lichens may dissolve rocks.	
3	has the same effect of lichens on rocks.	
4	weathering and weathering are types	of weathering.

5 When the \_\_\_\_\_ in air reacts with \_\_\_\_\_ in rocks,

a red-colored rust is formed.

#### - Final Revision

- (water Nile Delta hurricane deposition gentle wind Egyptian Western Desert)
- A \_\_\_\_ forms a small sand dune, while a \_\_\_\_ forms large sand dunes like that in the \_\_\_\_.
- 2 \_\_\_\_ is a fan-shaped mass of mud and sediments.
- 3 Wind, \_\_\_\_\_, and gravity are natural factors that control erosion process.
- 4 The process of laying down sediment after its erosion is called

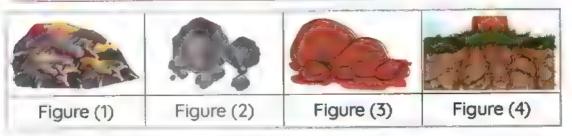
# 5

## Choose from column (A) what suits it in column (B):

Column (A)	Column (B)	
1 Lichens	a. causes mechanical weathering of rocks.	
2 Water	b. causes the red-colored rust on a toy car.	
3 Oxygen	c. produce acids as they grow on rocks.	
4 Melting and freezing	d. may cause both types of weathering.	
1 2 3	· 540	



# Study the following figures, then complete the following sentences:



- Figure ( \_\_\_\_\_ ) represents a living organism that causes mechanical weathering.
- 2 Figure (\_\_\_\_\_) represents a living organism that causes chemical weathering.
- 3 Oxygen gas has a bad effect on rocks in figure (\_\_\_\_\_).

Give reasons for:
The Earth's surface is always changing.
② Oxygen in the atmosphere has a bad effect on some rocks.
Lichens dissolve rocks as they grow.
Chemical weathering causes greater changes to the rocks.
© Erosion and deposition are linked processes.
What happens if?
① Oxygen gas reacts with iron rocks, forming a red-colored rust?
Acid rain falls on rocks?
The lichens that grow on rocks produce acids?
Plant roots grow inside rocks' cracks?

# Changing Landscapes

# 1 Summary of Concept 2

Many factors can change the Earth's surface and form new landforms, such as:



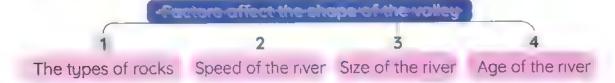


They are special types of valleys carved by flowing water.

Processes	Weathering and erosion	
Factors	Water, wind, and other factors	
Age	Canyons take millions of years to be formed.	
	• The sides are steep.	
Properties	Walls are narrow and vertical.	
	They usually consist of many layers.	

# How are canyons formed

- 1 Gravity pulls rainwater downhill, forming small streams.
- 2 Small streams are joined together to form a bigger stream (river).
- 3 The water of the river moves fast and erodes rocks in its pathway.
- 4 When a river dries after a very long time, a canyon may be formed.



#### Examples of canyons and their properties

# The Grand Congon

• The Grand Canyon is the largest canyon in the world.

Location	United States of America
Age	It is millions of years old.
Shape	• It is very large and steep.
	• It contains many layers of rocks.
	There is a river at the bottom.







• Color: Brown and black



Color: Reddish

## (Cirladi Rum (Sardan)



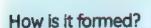
Color: Reddish
 V-Shaped

# (1) Colored Cargari (Sinol)



Color: Reddish
 V-Shaped

- Final Revision
- · When water is moving over the sand, it pushes some of the sand away and leaves an impression.
- Small canyon:



A stream of water may have formed it.

- What is your evidence?
- There are trees and plants on both sides.
- The sides are gently sloped

What happens if it rains a lot on it?

It will become deeper.



#### Valleys:

They are lowland areas between mountains.

**Processes** 

Weathering and erosion

**Factors** 

Water, wind, and other factors.

The sides are gently sloped.

- **Properties**
- They are usually surrounded by a wide, flat plain,



#### Similarities between canyons and valleys

- They are formed by rivers or streams.
- They often have rivers or streams flow in the bottom.



**Process** Deposition

Factor Water

Shape Triangular (fan) shape



#### How is delto form



Fast-moving rivers carry sediments called silt



The water of the river is full of sediment that has been collected along the journey.

Silt is made up of very fine bits of sand clay or rock materials



When the rapid flowing water "of the river" enters still water "lake", or slower water "ocean or sea". water loses energy and drops the sediment that it is carrying, forming a delta

 The wetland of plants in the delta helps in increasing deposition Because they are responsible for slowing down the water in the river.

#### The Nile River Delta

"The most famous delta in the world".

Area	It covers over 20,000 km² in Egypt.	
Location	Lies between Cairo and the Northern coast of Egypt.	
Importance	It is characterized by the presence of fertile soil that allows the cultivation of different types of crops.	

#### → Final Revision



#### Sand Dune:

Shape	A hill of sand
Location	Sandy desert or sandy beach
Area	<ul> <li>They are found in groups.</li> <li>They may cover a large area (Hundreds of meters tail).</li> </ul>
Processes	Erosion and deposition
Factors	Wind-blown sand
How they	Sand dunes are formed when a barrier like a rock blocks the

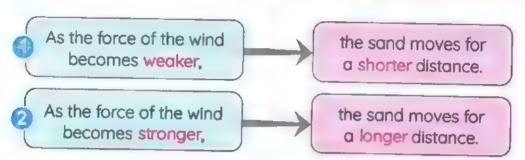
#### Sand Dunes Movements



- Dunes are interesting because they are constantly moving, as follows:
  - When wind blows across a dune, it erodes away the sand grains from the side it blows.
  - The grains of sand are carried up by the wind along the slope of the dune.
  - When they reach the top,
    the dune forms a barrier to the wind.
    So, the sand grains roll down the other side.

#### Wind Erosion

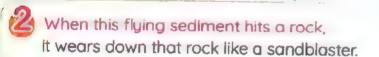
- The wind in the desert can be a powerful force of change.
- Wind and sand work together to erode rocks.
- The distance that the sand grains move depends on the force of the wind.



The way the sand moves depends on the direction of the wind.



When wind blows across the land, it picks up sand and other rock particles and carries them along.



This process carves the rock into strange shapes.

Recognizing signs of weathering, erosion, and deposition is very useful.

Because it helps us build houses in safe places, where:

- People must not build a house on a hill that is eroding.
- 2 People must not build a house very close to a river.



# 2 Definitions of Concept 2

Valleys	They are lowland areas between mountains.	
Canyons	They are special types of valleys with steep sides.	
It is a landform formed by the deposition of sedimer when a river meets a sea.		
Sand Dune	It is a hill of sand created by the erosion and deposition of the wind-blown sand.	
Slits	They are sediments that contain very fine bits of sand, clay, or rock materials.	

# Give Reasons for Concept 2

- You must avoid building a house on a hill and exposing it to erosion.
  - Because the river may change its path and cause erosion and deposition of the house.
- There are similarities between valleys and canyons.
  - Because both of them were formed by flowing water.
  - Because they may have rivers or streams flowing through their bottoms.
- A delta is formed when flowing water enters still water.
  - Due to the deposition process, as water loses energy and drops Its sediments forming a delta.
- The roots of plants increase the deposition of rivers' sediments.
  - Because the roots of plants slow down the water movement, which increases the rate of the deposition process.
- Delta allows the cultivation of different types of crops.
  - Because it has fertile soil.
- Sand dunes are constantly moving.
  - Due to the force of the wind.

# 4 What Happens if...? Concept 2

- Streams of water flow over flat land?
  - They may form small canyons where they flow.
- It rains a lot in a small canyon?
  - This small canyon will get deeper.
- Small streams of water join together?
  - It will form a river, which causes more erosion.
- The wind blows across a sand dune?
  - Sand grains are eroded away from the side of the wind coming from.
- Wind-blown sand hits a big rock?
  - Sand is deposited, forming a sand dune.
- The force of the wind carrying sand increases?
  - Wind will move sand grains for a longer distance.
- The direction of the wind changes?
  - The way the sand moves changes.

# 5 Revision on Concept 2

Choose the cor	rect answer:		
A canyon may tal	ke of ye	ars to be formed	•
a. hundreds	b. tens	c. millions	d. couple
Canyons can be f	formed in many	ways, including	Alt. 1 Mr. 33-48
a. weathering on		b. erosion only	
c. weathering and	d erosion	d. erosion and	deposition
(3) If the rain falls over	er a canyon sev	eral times per ye	ear,
a.its depth increa	oses	b. its depth dec	
c. it becomes flat		d. not be affect	
The shape of a ro	ock gets worn ar	nd rounded by th	e effect of the
process.			
a. weathering	d. deposition	c. erosion	d. photosynthesis
is/are	evidence of dep		
a. A rounded, wa	rn rock	· ·	and on the ground
c. An area with c		d. Red-colored	
A river may mak	e a new at i		ne process.
a. mountain, deposition b. canyon, erosion			
c. land, deposition		d. land, weath	
		nill, forming smal	
a. Magnetism	b. Gravity	c.Sunlight	d. Wind
All the following:	factors affect th		alley, except
a. the river's size		b. the river's s	•
c. the rocks' type		d. the rocks' c	
A is a	deep valley with	h high, steep side	
a. hill	b. mountain	c.canyon	<b>d</b> .dune
@ are lo	wland areas wit	th gently-sloped	
a. Valleys	b. Deltas	c. Canyons	d. Dunes
(1) When a river me	ets a sea or an a	ocean, a landforn	n known as a
is formed.			
a. canyon	b. volcano	c. mountain	d. delta

12	All the following are created by	the water of r	ivers or st	rean	ns,
	except				
	b. deltas b. canyons c	valleys	d. sand du	nes	
13	Silt carried by water contains all the	following, excep	ot to	•	
	a. sand b. clay c	. rocks	d. glass		
13	A sand dune is formed by the	process, then the	proc	ess.	
	a. deposition, erosion	erosion, weath	ering		
	c. erosion, deposition	l. deposition, we	athering		
15	Which of the following factors helps	In the formation	n of sand d	unes	?
	a. Water b. Wind	Light	d. Heat		
16	When a rock blocks the path of flying	ng sand, a	_ may be fo	orme	ed.
	a. dune b. river c	canyon	d. delta		
	Put (√) or (x):				
	Wadi Rum in Jordan is an example	of a sand dune.		(	_
_01_	All canyons have the same shape, to			6	)
	The sides of the canyon at the begin				
	gently-sloped.	3		(	)
	Understanding the formation of la	andforms helps	us predict	futu	re
	changes of landforms.	,		(	)
(5)	It is better to build your house on a l	hill that is erodin	g.	(	)
	A river never changes its path, so it	's safe to build a	house ned	ar ar	ny
	river.			(	)
(3)	When a river moves down a steep s	lope, its speed o	lecreases.	(	)
8	Most valleys are formed due to the	erosion of man	y sediment	ts ar	nd
	their transfer far away.			(	)
9	The shape of the valley depends on	the type of its r	ocks.	(	)
10	A slow-moving river has a lot of ene	rgy, so it causes	more eros	ion.	
				(	)
11	A delta is formed when the speed of	f the river water	increases.	(	)
12	Silt carried by a river contains large	bits of sand and	i clay.	(	)
13	Sand dunes are formed when a rock	k blocks water-b	lown sand.	(	)
14	Sand dunes are formed by the depo	sition process o	nly.	(	)

## Final Revision The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of wind. Dunes are formed at the bottom of seas. Write the scientific term: it's a deep valley that formed due to the weathering and erosion of wind and water. (2) It's a force that pulls rainwater downhill, forming small streams. It's the world's largest canyon, located in the USA. They are often found at the bottom of both canyons and valleys. 🚳 It's a sediment carried by a river that contains sand, clay, and rock materials. It's a fan-shaped land that is formed when a river meets a sea. It's a process that causes the carving of rocks into different shapes by wind-blown sand. Complete the following using the words between the brackets: 💧 (small canyon – impression – V-shaped – water stream – brown and black-colored) 🚯 When the rain falls on a flat sandy land, it will leave an ..... Wadi Nakhr is a \_\_\_\_\_ canuon. Wadi Rum and colored canyon in Sinai are \_\_\_\_\_ canyons. In the beginning of a \_\_\_\_\_\_ formation, plants and trees grow at the two sides of it due to the effect of the (less - high - more - gravity - increases - sediments - many layers) Rainwater is pulled downhill, forming a small stream due to \_\_\_\_\_. When the water of a river moves downhill on a steep slope, the water speed \_\_\_\_\_ erosion. A small stream causes \_\_\_\_\_ erosion than a large river.

The force of rushing water erodes a lot of \_\_\_\_\_ of a mountain

Walls of canyons are very \_\_\_\_ and are composed of many \_\_\_\_\_,

and carries them away.

- (deposition canyon fan decreases increases delta)
- (1) A \_\_\_\_ is formed by the erosion process, while a \_\_\_\_ is formed by the deposition process.
- The Nile River Delta has a \_\_\_\_\_ shape.
- When the stream water speed \_\_\_\_, it causes \_\_\_\_ of sediments.
- When the force of blowing wind \_\_\_\_\_, the blown sand is carried for a longer distance.

## Choose from column (A) what suits it in column (B):



Column (A)	Column (B)
🕦 Wadi Nakhr	a. is a black and brown canyon in Oman.
Wadi Rum	b. is a V-shaped canyon in Jordan.
Small canyon	c. is a reddish canyon in Thailand.
A A	



Column (A)	Column (B)
Erosion	a. is the fine particles of clay, sand, and rock materials.
Deposition	b. occurs when a stream water rushes quickly downhill a mountain.
Sand dunes	c. are hills of sand usually seen in groups and they may cover large areas.
Silt	d. occurs when a stream water speed slows down at the end of a river.







#### - Final Revision

1	Cros

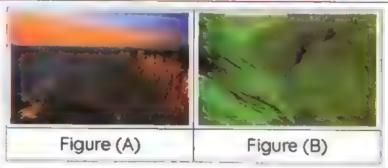
#### s out the odd word:

Mountain - Valley - Gravity - Canu	
**** MODELLICITY - VOIDELL - LAFOVITH - LAFO	O

1	`
(	



## Study the following figures, then put $(\checkmark)$ or (x):

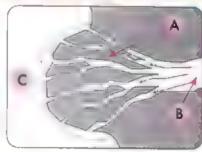


A.	The	landform in	figure (A)	has	gently-sloped	sides.	
----	-----	-------------	------------	-----	---------------	--------	--

- The landform in figure (B) may be surrounded by some plains between mountains.
- Both landforms are formed due to erosion carried by rivers.
- The walls of the landform in figure (A) are higher than those in figure (B).

## Study the following figure, then choose the correct answer:

- 1) The area (A) would become a ......... (delta - canyon) due to the \_\_\_ (erosion - deposition) process.
- 2 The \_\_\_\_\_ (area "C" area "B") could be a sea or a lake.
- The \_\_\_\_ (area "C" area "B") is a river.



## Study the following figure, then complete:

- The erosion of sand occurs in area
- The deposition of wind-blown sand occurs in area ...



0	Give reasons for:
	It is not safe to build a house close to a river.
2	Valleys and canyons are formed in the same way.
3	Sand dunes are formed in a desert.
	What happens if?
: 1	A water stream flows over a flat land?
2	A lot of rain falls on a small canyon?
3	Small streams of water are joined together? (concerning erosion)
	A river carrying sediments meets a sea?
5	Wind-blown sand grains hit a big rock in the desert?

PROJECTS



# Project 1 Unit 3

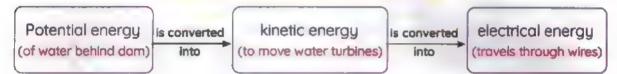
## **Dam Impacts**

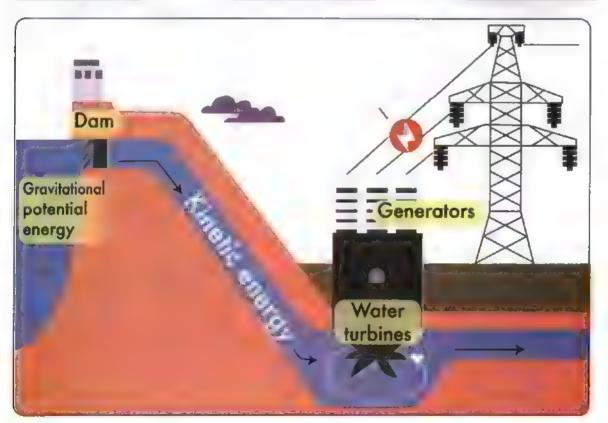


#### Solve Problems Like a Scientist

- >>> We have learned that humans use the kinetic energy of water to generate hydroelectricity by building dams on rivers to control water and increase the energy of water.
- >> A dam is a structure that is built on rivers for conserving water.

#### **Energy Chain of a Dam**



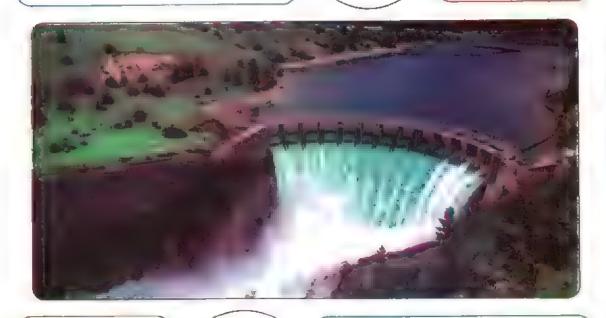


They are used to generate hydroelectric energy.

They control the flow of water to rotate wind turbines.

Advantages of Dams

They provide a steady water supply.



The cost of construction of dams is high.

Disadvantages of Dams The change in the path of rivers affects the migration of fish or other natural habitats.

There is a risk in the case of earthquakes.

#### A solution for the problem of building dams

There is a risk in the case of earthquakes.



- High-standard materials are required to build dams.
- [2] Regular maintenance of dams is necessary.

## Interdisciplinary Project

## **Sunny Side up**

- The project "Sunny Side up" helps you think about the impact of deforestation and how humans can use solar energy as a clean source of energy.
  - بساعدك مشروع الجانب المشرق على التفكير في تأثير إزالة الغابات، وكيف يمكن للإنسان استخدام الطاقة الشمسية كمصدر نظيف للطاقة.

#### Deforestation

- Cutting down trees to get wood for cooking may lead to deforestation that has negative impacts, such as the death of some animals or plants
- Deforestation can be stopped by using solar energy instead of wood from trees as a source of energy for cooking food.
- Some difficulties humans may face when using solar energy including the fact that the materials used to collect solar energy are very expensive.
  - قطع الأشجار من أجل الحصول على الوقود الخشبي من أجل الطهي قد يؤدي لإزالة الغابات التي قد يكون لها آثار سلبية مثل موت
     بعض الحيوانات أو النباتات.
    - يمكن وقف إزالة الغابات باستخدام الطاقة الشمسية بدلًا من خشب الأشجار كمصدر للطاقة لطهي الطعام.
  - قد يواجه الإنسان بعض الصعوبات عند استخدام الطاقة الشمسية؛ بسبب أن اللواد المستخدمة لتجميع الطاقة الشمسية باهظة الثمن.



## Solar Cooker

A device that converts solar energy into thermal energy is used in cooking food.

هو جهاز يُحوّل الطاقة الشمسية إلى طاقة حرارية تُستخدم في طهى الطعام.





## Structure:

- It contains metal plates placed in a certain way to collect the largest amount of solar energy and focus it in one area.
- It also contains materials that keep the generated thermal energy inside the solar cooker for a period of time enough to cook food inside.
  - بحتوي الموقد الشمسي على ألواح معدنية مُوجَّهة بطريقة معينة؛ لتجميع أكبر قدر من الطاقة الشمسية
     وتركيزها في منطقة واحدة.
  - · يحتوي أيضًا على مواد تحافظ على الطاقة الحرارية المتولدة داخل الموقد الشمسي لفترة من الوقت تكفي لطهي الطعام بداخله،

# Project 2 Unit 4

## **Forces That Shape the Earth**



#### Solve Problems Like a Scientist

- >> In this project, you will use what you know about how the surface of the Earth changes to model how different environmental factors have affected the landscape of Wadi Nakhr over time.
- >> Wadi Nakhr's landscape has been shaped by the weathering forces of running water, wind, and erosion. You can also find evidence of volcanic activity that occurred millions of years ago.
  - سنقوم في هذا الشروع بتصميم نموذج يُوضَح أثر العوامل البيئية على مظاهر السطح في وادى نخر بمرور الزمن.
- لقد تشكَّلت مظاهر سطح وإدى نخر بفعل التجوية التي سببتها المياه والرياح وعوامل التعرية، وقد تجد أدلة على حدوث نشاط بركاني منذ ملايين السنين.





#### Look at the images of landforms in Wadi Nakhr.

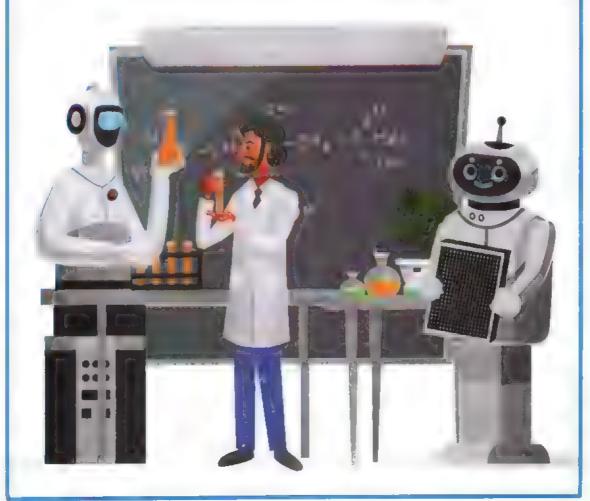
Then think about how different environmental factors can affect landscapes.

Then predict which factors affected the formation of each landform.

لاحظ الصور التالية لمظاهر سطح مختلفة في وادي نخر، فكّر في العوامل البيئية المحتلفة التي تؤثر على مطاهر السطح، توقّع العوامل المؤثرة على التضاريس الآتية:

		على النضاريس الآثية:
mage	Which factors affected the formation of this landform?	Less The Part of t
Large chunks of basalt	<ul> <li>Weathering by the forces of wind and water.</li> <li>عوامل التجوية التي سببتها الرياح والماء.</li> </ul>	Running water and wind carrying sand carve and break down rocks.     تتسبب المياه الجارية والرياح المملة بالرمال في نحت وتفتيت الصغور.
Smooth and steep sides		
Deep canyon, layers of rocks		
Folded and rippling mountainsides		

# Government Model Exams



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## 1 Cairo Governorate – Exam 1

(A) Choose the cor	rect answer:				
The forms of fue	present in car fo	uel stations are	промилана манениции 1		
a. gasoline and wood		b. natural gas	and coal		
c. wood and coa	1	d. natural gas	and gasoline	è	
Curiosity Rover is	s designed to exp	olore			
a. Earth	b. Mars	c. the Sun	d. the mo	on	
Sand is formed b	y the breaking o	lown of			
a. glass	b. wood	c.rocks	d. plastic		
All the following :	processes chang	je the Earth's sur	face, except .	· ••••••••••••••••••••••••••••••••••••	miere 4
a. weathering	b, erosion	c. digestion	d. deposit	ion	
(B) What happens	to a flat land if a	water stream fl	ows over It?		
	Questi	on (2)			
(A) Put (/) or (X):	4555				
Both canyons ar	ıd valleys often h	nave rivers at the	eir bottom.	(	)
Plants roots help	in the formation	of rocks.		(	)
Energy can't be	changed from or	ne form to anoth	er.	(	)
The Sun is the mo	ain source of forr	ming biofuel and	fossil fuel.	(	)
(B) Give a reason for	r: Iron in rocks r	may rust.			
	Questi	on (3)			
(A) Complete the f			words belo	ow:	
(th	nermal – gravity	– chemical – wa	rm)		
When fossil fuel	is burned, it prod	ucesene	ergy.		
When we expose	our bodies to th	ne Sun, we feel	**** *********************************		
Types of weather	ring can be class	ified into mecha	nical weather	ing o	ind
weathering	ng				
Rain water is pul	led downhill form	ning small strear	n due to	MINISTRAÇÃO Ó	
(B) Cross out the or	<b>dd word:</b> Solar e	energy - Coal - N	atural gas - C	Gasol	ine

# 2 Cairo Governo ala - Exam 1

A) Choose the	correct answer				
-		ive to the combina	tion of		
a. dissolved		b. red-colored			
c. living org	anisms	d. acid rains			
A canyon m	nay take of	years to be formed	d.		
a, hundreds		411-	d. a cou	ple	
Inside the el	ectric power station	ns, the heating of			.חונ
a, turbines		rs c. water	d. fuel		
The energy	source in a toy car	Is the			
a. engine	b. tires	c. battery	d, fuel		
B) What happ	ens if: A river carr	ying sediments me	ets a sea?		
	Oues	tion (2)			
A) Put ( / ) or (					
_		ne increase of the o	XUGEN Derce	entage	in
the atmosph				) (	)
Deposition p	process never chan	ges the shape of th	ne land.	(	)
and the second	conserve all forms			(	)
		ines is transmitted th	rough the wi	ind (	1
		ust reduce the usag			
		tion (3)			
A) Complete ti		tences using the	words hel	OWC	
		une – weathering –			
		ng-wind sand hits o			
		which rocks are br		to for	m
sediments.					
Some forms	of fuel can be use	ed in cooking food,	, such as wo	ood ar	nd
* 10079488888888800784444444					
		dform found betwe	en mountai	ns.	
) Cross out th					
Solar energy - V	Vind energy - Natu	ral gas - Water	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		_)
				_	

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# 3 Cairo Governorale Luituun Ilunu

(A) Choose the c	orrect answer:			
The main sou	rce of most of energ	y on Earth is the		
a. electricity	b. Sun	c. moon	d. wind	
is the	process in which sec	liments are mov	ed to another pl	ace
on the Earth's	surface.			
a. Erosion	b. Weathering	c. Deposition	d. Melting	
Nonrenewable	le resources of energ	y include	- T	
a. wood	b. gasoline	c. grass	d. water	
Which of the	following factors help	ps in the formation	on of sand dune	s?
a. Water	b. Wind	c. Light	d. Heat	
(B) What are the	e types of weather	ring?		
	Questio	m (2)		
(A) Put (/) or (X		, (L)		
<b>W</b> Using fossil fu	uel protects the envir	onment from po	llution. (	)
Mechanical w	veathering causes a	change in the st	ructure of the ro	ocks
and a new su	bstance is formed.		(	)
The shape of	the valley depends	on the types of r	ocks. (	)
The electrical	energy that is genera	ated from water is	called hydroele	ctric
energy.	٠		(	)
(B) What are the	e factors that caus	se erosion?		
	Questic	m (3)		
(A) Write the sc		10/		
	ılley with steep sides.		(	)
	from the remains of			
periods of tin		F	(	-
	either be created no	r destroued: it co	•	
	m to another.	,	(	
	ilt on rivers to contr	rol the water flo		
	rgy of water.		(	
	mple of: A landform	that is formed by	*	_

# 4 Colro Osvernorale - Al-Azhaer Al-Star M

## Question (1)

Chooca	de la co	AND REAL PROPERTY.	CONTRACTOR OF THE PARTY OF THE
CHODSE	LITTE		answer:

c. Nile River delta formation

1	is a renewable resource of energy.				
	a. Coal	b. Natural gas	c. Water	d. Fossil fuel	
2	The input energy	used to control th	ne Mars exploration	on vehicle is	
	a. electrical energy		b. light energy		
	c. kinetic energy		d. mechanical e	nergy	
( <b>3</b> )	Which of the following is an evidence of erosion?				
	a. Sand dunes for	mation	b. Forming rock	s crumbs	

#### Question (2)

d. Breaking of a rock

#### Choose from column (A) what suits it in column (B):

Column (A)	Column (8)
The Law of	a. is among nonrenewable energy
Conservation of Energy:	resources.
2 The Sun	<ul> <li>b. Energy isn't destroyed, but it can only be converted from one form to another.</li> </ul>
3 Wind turbines	c. convert wind energy into electrical energy.
	d. is the main source of energy on Earth.
	e. Energy is destroyed and cannot be transformed from one form to another.

## Question (3)

#### Put (√) or (X):

	Most valleys are formed due to the erosion of many sedimen	ts c	bnt
	their transfer far away.	(	)
2	The formation of sand dunes in Eastern Desert in Egypt is due	to	the
	movement of the wind.	(	)
3	The energy produced from the flowing water of waterfalls and	d d	am
	turbines is called chemical energy.	(	)

## Question (4)

#### Write the scientific term:

- 11's a type of fuel made from living organisms that can be planted.
- It's the energy produced by the biender that helps it do its job.
- It's the process in which rocks are broken into smaller particles.

#### Question (5)

## Complete the following sentences using the words below:

(wood - water - electrical - light - coal - natural gas)

- Ancient people used \_\_\_\_ as a fuel before discovering gasoline.
- is a renewable resource of energy.
- The energy that is produced from solar panels is \_\_\_\_\_ energy.

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# 5 Gira Govarnurule - Exam 1

(A) Choose the correct answer:	
1 In the washing machine, energy is converted into kinetic energy	
a. light b. thermal c. electrical d. potential	
All the following are forms of fossil fuel, except	
a. wind b. coal c. natural gas d. oil	
Sand is formed due to the breaking down of	
a. glass b. rocks c. plastic d. wood	
The breaking down of large rocks into small particles represents the process.	е
a. weathering b. photosynthesis c. erosion d. deposition	
B) Give a reason for: The iron in rocks may rust.	
Because Iron reacts with gas.	
Question (2)	
A) Put (/) or (X):	
Water causes both mechanical and chemical weathering.	)
A canyon is a type of valleys.	)
Oil and coal are considered nonrenewable energy resources. (	)
·	)
B) What happens if:	
A river carrying sediments meets the sea?	
Question (3)	
A) Complete the following sentences using the words below:	
(Sun - water - sound - biofuel)	
Wind, and gravity are natural factors that control the erosion process	ì.
Wood and charcoal are examples of	
Most of energy chains start with the	
The output energy of the hand bell is energy.	
B) Cross out the odd word:	
Plant roots - Wind - Acid rain - Temperature (	)

# Oixa Governorate - Exam

	Question (	<b>1</b> -):			
(A) Put (√) or (X):					
1 Energy cannot be	transformed from a	one form to an	other.	(	)
2 A hand bell conve				(	)
3 The Earth's surfac	e changes from tim	e to time.		(	)
4 When the iron in re			nger.	(	)
(B) Give a reason for					
Sand dunes are for					
Odija dolioo at o					
	Question	2)			
(A) Choose the corn					
1 Both the hair drye	r and the electric w	ater kettle prod	duce	ener	gy.
a.chemical	b.thermal	c. light	d. potenti	al	
2 All the following a	re renewable energ	y resources, e	xcept		
	b.water				
	valleys carved by th				
	b. Hills				
4 Moving the sedime				proc	ess
	b. photosynthesis				
(B) Complete: A					ents
	river enters a large l				

## Question (3)

## (A) Choose from column (A) what suits it in column (B):

Column (A)	Column (B)	
1° Wood	a.is a fossil fuel.	
2 Coal	b. is one of the mechanical weathering factors.	
3 Acid rain	c is a biofuel.	
4 Temperature	d. is one of the chemical weathering factors.	

(B) What happens if: The lichens growing on rocks produce acids?

The rocks will be

# Giza Governorate – Exam 3

# Question (1)

١	Write	the sci	entific	term:
- 1	FFILE	CITE SE	CITLIIL	LCI III:

1 It's the form of ene	ergy that is stored in the battery of a remo	ote conf	trol.		
	(		)		
2 It is a phenomenon in which the Earth's temperature increases when					
carbon dioxide ga	s increases in the air.	e le aleftificansserae maneuls	)		
3 It's energy that is	generated from windmills and transmitte	ed throu	ıgh		
wires to houses an	d factories.		)		
They're hills of sand	in deserts that are formed by erosion and	deposit	ion.		
	(	mendahah alaman	)		
5 They're tiny plant-like organisms that produce acid on rocks, making					
them break down.	(		)		
	Question (2)				
ut (/) or (X):					
1 Energy cannot be transformed from one form to another. ( )					
2 Most energy chains start with the moon. (					
3 When pedalling a bike, the chemical energy in your body changes to					
kinetic energy.		(	)		
.4. There is a stored chemical energy inside the food we eat.			)		
5 Biofuel is a nonren	ewable resource of energy.	(	)		
	Question (3)				
A) Choose from colo	umn (A) what suits it in column (B):				
Column (A)	Column (B)				
1 Solar panels	a. are used in cooking food.				
2 Curved mirrors	b. were used to grind grains.				
3 Windmills	c. are used to generate electricity.				
2) Enom the opposit	e digueses		mere A		

#### (B) From the opposite f

- What is the name of this device? \_\_\_\_\_
- 2 It changes \_\_\_\_ energy to \_\_\_\_ energy.



## 8 Qalyubiyya Governorale

## Question (1)

	4.	Cotton (1)	
(A) Choose the	correct answ	er:	
1 is the	e main source o	of energy on the	Earth's surface.
a. Oil	<b>b.</b> Gasoline	c. Natural gas	d. The Sun
2 In water tur electrical end		energy of the	ne water is changed into
<ul><li>sound</li></ul>	b. kinetic	c. thermal	d. potential
30Is a r	enewable sour	ce of energy.	
a. Oil	<b>b.</b> Wind	c. Coal	d. Natural gas
4 may	cause chemica	al weathering or	mechanical weathering.
a. Oxygen	<b>b.</b> Water	c. Rocks	d. Lichens
(B) Cross out th	e odd word:		
Weathering - P	hotosynthesis -	- Deposition - Er	oslon (
	O	uestion (2)	
(A) Put (/) or (/		destion (2)	
	-	of years to be fo	ormed. (
	-	t with the moon.	(
			he remains of ancient plant
e charcoario la			(
4 Biofuel is a r	nonrenewable r	resource of energ	gy. (

#### (B) Write the scientific term:

It's a kind of weathering that changes the structure and color of rocks.

## Question (3)

#### (A) Choose from column (A) what suits it in column (B):

Column (A)	Column (B)		
1 A greenhouse	a. are used to generate electricity from solar energy.		
2 A valley	b. usually has a triangular shape.		
3) A delta	c. has gently-sloped sides.		
Solar panels	d. helps to grow crops that only grow in warm climates.		

(B) Give an example of: A fossil fuel.

## 9 Alexandria Coverne, nte Exami

## Question (1)

(A) Choose the correct answer:			
Energy isn't destroyed nor created from nothing. This indicates			
a. the drawing of energy resources			
b. the conservation and transformation of energy			
c. that the resources of energy are numerous			
d. the destruction of energy resources			
is a resource that we consume at a faster rate than its formation in nature.			
<ul> <li>Wind</li> <li>Water</li> <li>Solar energy</li> <li>Fossil fuel</li> </ul>			
Dissolving minerals from rocks and recombining them with new			
substances is an example of			
a. mechanical weathering b. weathering by wind			
c. deposition in rivers d. chemical weathering			
The steep valleys that are formed due to the flowing water erosion are called			
a. canyons b. sand dunes c. hills d. delta			
(B) Give a reason for:			
The roots of trees can be an agent for shaping the Earth's surface.			
Question (2)			
(A) Complete the following sentences:			
The output energy of the halr dryer that helps it do its function is			
energy.  In large cities, pollution with causes irritation in the eyes and			
lungs.			
Types of weathering are weathering and chemical weathering.			
After rocks weathering, the process of occurs and the sand			
and soil move to another place.			
(B) What happens if:			
Oxygen gas reacts with iron rocks forming red-colored rust?			
(A) Put (/) or (X): Question (3)			
Both a canyon and a valley often have rivers or steams that flow			
through their lowest point. ( )			
All the changes to Earth's surface take hundreds of years. ( )			
( ) Wind and solar energy are nonrenewable energy resources.			
Mars Rover robot uses the same energy used in a remote-controlled			
toy car.			
(B) Write the scientific term: Gasoline - Coal - Natural gas ()			

## 10 Manandriu Severnerate Exam 2

## Question (1)

(1)		
(copper - Sun - ele	ctric lamp - charc	oal)
1 Wood and are examples	of biofuel.	
2 Most of energy chains start with	the	
3. The device used to convert elect	rical energy into liq	ght energy is the
( Electric wires are made of	more b	
(B) Put (√) or (X): The burning of g	gasoline produces	heat energy. (
Quest	ion·(2)	
(A) Choose the correct answer:		
1 All the following are processes	that can change	the Earth's surface
except for		
a. digestion b. erosion	c. weathering	d. deposition
2 and cause mech	anical weathering	
a. Plant's roots, acid rain	b. Lichens, wa	ter
c. Oxygen, water	d. Water, plan	t's roots
<ol> <li>Oil is a nonrenewable energy re</li> </ol>	source that is use	d inside the
a. flashlight	b. car engine	
c. electric fan	d. washing ma	achine
4 Curiosity Rover is used to explor		
a. Earth b. Mars	c. the Sun	d. the moon
(B) Write the scientific term:		
	and the same of th	

It's the energy produced from playing the guitar.

## Question (3)

#### (A) Choose from column (A) what suits it in column (B):

Column (A)	Column (B)	
1 Water	a. is formed from the remains of dead plants.	
2 Wind energy	b. is the main source of energy on Earth.	
3 Coal	c. is a liquid renewable resource of energy.	
4' The Sun	d. is used to generate electricity through wind turbines	

(B) Give a reason for: The iron in rocks may rust.

## 11 Alexandria Governarate - Exam 1

## Question (1)

(A) Choose the correct answer:		
1 When you use the hand bell, energy changes into soun	d ene	rau.
a. light b. thermal c. kinetic		33
2 When a rock blocks the path of flying sand, a may be	e form	ed.
a. dune b. river c. canyon		
3 is a renewable resource of energy		
a. Coal b. Natural gas c. Water		
4 A canyon may take of years to be formed.		
a. tens b. hundreds c. thousands		
(B) Give a reason for:		
We must turn off the lights that we don't need for a while.		
Question (2)		
(A) Cross out the odd word:		
1 Erosion - Weathering - Digestion - Deposition (	1881 Maraman (444) - 4 345	)
2 Wood - Natural gas - Gasoline - Glass (	mand-mandelik (d. 1.1.1) (d. 1.1.1)	)
3 Acid rain - Wind - Plant root - Temperature (		)
Fossil fuel - Waterfalls - Wind - Sunlight (		)
(B) What happens if:		
The lichens growing on rocks produce acids?		
Question (3)		
(A) Put (/) or (X):		
1) Both canyons and valleys often have rivers in their bottom.	(	)
2 Solar cells are composed of many solar panels.	(	)
Mars is located a few meters away from Earth.	(	)
There is a stored chemical energy inside the food we eat.	(	)
(B) Write the scientific term:		
It's any substance that produces thermal energy when it is burned.	(	)

## 12 Dakabila Galemorate /

## Question (1)

(A) Complete the following sentences:

Light energy is converted into energy, which is stored in the				
form of sugar inside the trees.				
is used as a source	of thermal energy	in homes and cars.		
are deep valleys o	arved by the flowin	g water.		
is the process of lo	aying down sedime	nts after their erosion.		
(B) What happens if: Acidic r	ain falls on rocks?			
(A) Put (√) or (X):	uestion (2)			
Using solar energy is a war	u to conserve fossi	fuel. ( )		
Water is a nonrenewable re				
energy.		( )		
Acid rain is formed when a	arbon dioxide disso	lves in the water found in		
the air.		( )		
Deforestation is caused by the overuse of fossil fuel.				
(B) What is the role of wind in mechanical weathering?				
Question (3)				
(A) 1- Write the scientific term:				
Energy is neither created nor destroyed; it can only be converted from				
one form to another.				
It's a gas in the air that combines with the iron in some rocks and				
causes its weakness.				
2- Complete the following table:				
Device	Input Energy	Output Energy		
Electric heater		ga add as gillimiddiaudiralis coverbal midall 64 de 64 de feire de 1970 e - Entrefferendae 64 de		
Battery in your toy				

(B) Give a reason for: Dams are built on rivers.

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# 13 Que Gevernorate

## Question (1)

A) Choose the corr	ect answer:		
Curiosity Rover is	designed to expl	ore	
a. Earth	<b>b</b> .Mars	c.the Sun	d.the moon
Which form of en	ergy is not used	or produced wh	nen you turn on an
electric bulb?			
a. Light energy	<b>b</b> .Heat energy	c. Electrical ener	gy <mark>d.</mark> Sound energy
The formation of	canyons takes	add -Addies verlet 4	
a.a few minutes	<b>b</b> .a few hours	c.a few days	d.many years
Gentle wind can c	arry sand grains	for dista	nces
a.short	<b>b</b> .long	c.huge	d.large
B) Give a reason for	r: Iron in rocks me	ay rust.	
	Questio	n (2)	
A) Put (/) or (X):	Questio		
Wind can be consi	dered one of the	factors that caus	se weathering.( )
The Earth's surface	e never changes.		( )
(3) In a modern wind	turbine, kinetic	energy is conve	erted into chemical
energy.			( )
The Sun is the ma	in source of energ	gy on Earth.	( )
B) Cross out the od	d word: Gasoline	e – Charcoal – C	oal - Natural gas
	Questio	n (3)	
A) Complete the fo	llowing senten	ces using the v	words below:
(ge	ntly - renewable	- Oil - deposition	1)
The sides of the c sloped.	anyon at the beg	ginning of its for	mation are
② is a nonrer	newable source o	f energy.	
Using the	resources of en	ergy costs more	money.
The process of lay	ing down sedime	ent after their erc	sion is called
R) What hannens if	A river that carri	ies sediments m	eets the sen?

## 14 Part Suid Cerail.ord 4

## Question (1)

	יייני	Choose the correct answer.	
	1	Fossil fuel needs to be formed under the Earth's surface.	
		a. five years b. ten years c. hundreds of years d. millions of year	S
	2	Water flows through the turbines in the dams to generateenergy	
		a. electrical b. potential c. solar d. light	
	3	When a river meets a sea or an ocean, a landform known as a	**********
		is formed.	
		a. canyon b. volcano c. mountain d. delta	
	4	If the rain falls over a canyon for several times per year,	
		a. its depth increases b. its depth decreases	
		c. it becomes flat d. it won't be affected	
(E	-	Write the scientific term:	
	lt's	s a process in which rocks are broken down into smaller particles. (	)
		Question (2)	
(1	1)	Put (/) or (X):	
	1	Most energy chains start with the moon. (	)
	2	You need gasoline to move a bicycle. (	)
	3	Deposition process never changes the shape of the land. (	)
		Wind can pick up sand grains and form sand dunes. (	)
(	3)	Give a reason for: Iron inside rocks may rust.	
		Question (3)	
(1	4)	Correct the underlined word:	
		Curiosity is a robotic vehicle that is designed to explore the surface	of
		the moon.	
	2	Hydroelectric energy is a nonrenewable energy resource.	
	3	The origin of sand is the breaking down of some types of glass.	
		When the water of a river travels downhill on a steep slope, its spe	eed
		decreases.	

A river erodes the sediments of a mountain over a long period of time?

(B)What happens if:

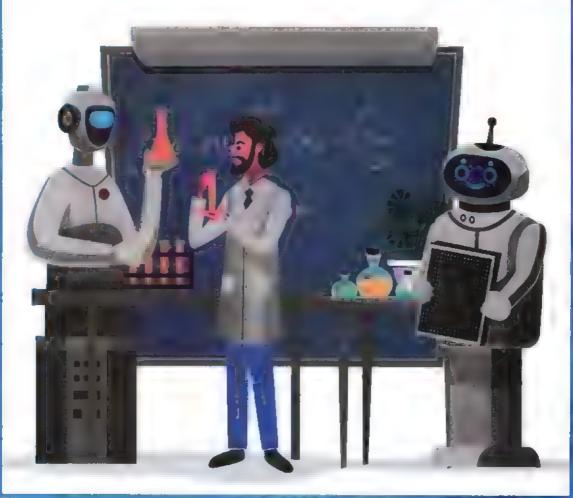
Science Prim. 4 - Second Term (97)

## 15 Behira Governorale

## Question (1)

A) Choose the o	correct ansv	ver:			
The stored er	nergy inside th	ne battery of a mobile	phone is	_ ener	gy.
a. electrical		b. light	c. chen		
Possil fuel is of	considered a	resource of en	ergy.		
a. renewable		b. nonrenewable	c. perm	anent	
is the bre	aking down of	rocks into small partic	les by physic	al facto	ors.
a. Mechanica	l weathering	b. Chemical weather	ing c. Erosi	on	
The process in	n which small	particles of sand, soll	and rocks a	re mov	ed
from a place	to another is.	•			
<ul><li>a. weathering</li></ul>		b. erosion	c. depo	sition	
B) Write the sci	ientific term	n:			
Energy is neither	created nor a	destroyed.	(		)
	Q	uestion (2)			
A) Put (/) or (X	):				
A spacecraft takes about 6 seconds to go to Mars. ( )				)	
Most of the energy we use is produced from the Sun. ( )			)		
Some types o	f plants can b	be used to make a liqu	uid fuel.	(	)
The roots of to	rees can mak	e rocks break down.		(	)
B) What are the	effects of the	he smog from cars o	on humans'	healt	h?
	Qi	uestion (3)			
A) Choose from	column (A)	what suits it in co	lumn (B):		
Column (A)		Column (B)			
Sand dunes	a. are specia	l types of valleys that	have steep	sides.	
Canyons	b. are pieces	of rock that break do	wn due to		
		g and move from their			ts
		and other factors of tr	· · · · · · · · · · · · · · · · · · ·	<b>1.</b>	_
Valleys	c. formed due to windblown- sand.				
Sediments d. lowland area between mountains.					
) Write the sci	entific term	It's the device in elec	ctric power s	tations	ì
that converts kinetic energy into electrical energy. ()					





#### Unit 3

## Comment 1

#### Lesson (1)

- D b
- ( d

- 🐠 d
- (1) c
- 2 1
- (3) X (2) X
- X

- Curiosity Rover
  - Chemical energy
  - Solar panels
  - Solar energy or light energy
- 🙆 🌒 chemical electrical
  - replace
- sensors
- sound kinetic
- (A) (D) c
  - (B) 🛑 a
    - a d (2) b
- (2)
- **(1)**
- (2), (3)
- To be operated and controlled.
  - To be operated so it can move and explore Mars.
  - Because robots on Mars are too far from local stores or sockets (plugs) on Earth to be replaced or recharged.
- The drone cannot be operated.
  - The Mars rover cannot be operated and can't explore Mars.

#### Lesson @

- d

- The Sun
  - Thermal energy
  - Chemical energy
  - Chemical energy
  - The spring
- **Energy** chain
- 👍 🌑 thermal energy (heat)
  - sound kinetic Coal
  - chemical kinetic
  - - @ C
- 3 a
- ( b 6

- 10 2 5
- Kinetic **(1)-(3)**
- (1) (3)
- **(2)**

- 8 Light
- chemical
- chemical kinetic
- Because all energy chains start with the Sun.
  - Because some of the energy escapes in other forms that the device doesn't use.
  - Because the chemical energy inside the wood changes into thermal energy.
  - Because the chemical energy inside your body changes into kinetic energy.

## Lesson (3)

- b
- M d
- al d

- (A) a

- Electric lamp
  - Thermal energy
  - Kinetic energy Sound energy
  - Thermal energy
  - Thermal energy
  - Chemical energy
  - Blectric energy Dight energy
  - 10 The Sun
- Copper
- Law of conservation of energy
- Light energy
- electric
  - a electric- output a electric
  - sound kinetic
- 6 🕦 light sound
  - chemical kinetic
  - input output
- 1 d 2 c 3 a
- (3) (5) Chemical energy Light and thermal energies.
  - Minetic energy Sound energy
  - Electric energy Light and thermal energies
- (A) Chemical kinetic –thermal
  - (B) Electric light thermal
- Because some of the electric energy changes into thermal energy.

- Because some of the electric energy is wasted in the form of thermal energy.
- Because some kinetic energy changes into thermal energy due to friction.
- The kinetic energy changes into thermal energy.
  - The electric energy changes into light and thermal energies.
  - The electric energy changes into kinetic energy.
  - The potential energy changes into kinetic energy.
  - They will get warm (as their temperature increases).
  - You will feel warm.
  - The chemical energy changes into kinetic energy.
  - The electric energy changes into light and sound energies.

## (Illusson 🐠 🌣

- h the case of the
  - 🎒 d 🎉 a
- 2 1 x 2 / 3 x
- Sound energy
  - Thermal energy
- Because it doesn't help the blender do its function.
  - Because it helps the electric heater do its function.
- 6 It will produce thermal energy.

## Model Example

#### Question 1

- (A) (B) a

- (B) Thermal energy

#### Question (2)

- (A) (B) / (B) X

(B) Lamp

#### Question (3)

- (A) (B) c
- (2) d

- (B) Because it doesn't help the device do its function.

## Model Exam

#### Question 1

- (A) (II) a

- (B) Thermal energy

#### Question (2)

- (A) (B) X

(B) Light bulb

#### Question (3)

(A)

Device	Input Energy	Output Energy	
Blender	Electric energy	Kinetic and sound energies	
Kettle	Electric energy	Thermal energy	
Hand bell	Kinetic energy	Sound energy	

(B) The electric energy will be converted into kinetic energu.

## Concept (2) Lesson (1)

- d d
- 2 b
- a d

- (6) d

- (10) d
- - 2 X
- 3 X

- The Sun
  - Gasoline pointer
  - Gasoline
  - Chemical energy
  - Thermal energy
- 👍 🐠 Fossil fuel underground
  - acoline pointer
  - coal wood
- Oil
- (A) (I) c
  - (B) (B) b
- (a) b (3) d
- (C) (b) (2) d gasoline pointer - fuel
  - **2** (1)
- (3)
- (2)

(3) C

- Because gasoline burns inside the car's engine, the engine then rotates the wheels of the car.
  - Because it helps the driver check the fuel in the car's fuel tank
- The chemical energy changes into thermal energy.
  - The car will stop.
  - The chemical energy stored in the gosoline is converted into thermal energy.

#### Lauson 2

4	T	C
V	6	















33 d





















The Sun

Fuel Monrenewable resource

Renewable resource

Biofuel.

Fossil fuel

(2) Oil (9) Coal

Charcoal

10 Liquid fuel

Deforestation

A) (A) wood

a oil-underground

deforestation

(B) neat - pressure

Oil - coal

renewable - nonrenewable

decreased













Renewable Resource of Energy	Nonrenewable Resource of Energy
Charcoal	Oil
Corn	Gasoline
Grass	Natural gas
Wood	Coal
Water	
Wind	

1	(4)	(2)	(3)	<b>(1)</b>
8	<b>a</b> (2)	<b>(4)</b>	(3)	<b>(1)</b>
	<b>(5)</b>			
9	(I) Oil		Coal	
	Char	rcoal	Coal	

	W (~)		
	P.O.C	Fossil Fuel	Biofuel
	Renewable or Nonrenewable	Nonrenewable	Renewable
	Examples	Oil – Coal – Natural gas	Wood - Grass -

Charcoal

(B)

P.O.C	Coal	Charcoal
Type of Fuel	Fossil fuel	Biofuel
Primary Source	Sun	Sun
Renewable or Nonrenewable	Nonrenewable	Renewable

- Because they cannot be easily renewed.
  - Because it is renewed by the continuous growth of plants.
  - Because it will cause deforestation.
  - Because it is extracted from deep ground under the Earth's surface and can't be renewed easilu.
  - They will be decomposed and turned into oil or natural gas.
    - It will cause deforestation.
    - They will be decomposed and turned into coal.

\*

#### Lesson 🕲

- 1) 1) c 2 a 3 d 2 d 3 a 3 b 3 a 3 d 0 c 3 b
- Renewable resources
  - Thermal energy
  - Electrical energy
  - Steam
  - Generator

Turbine

- ◆ Steam generators

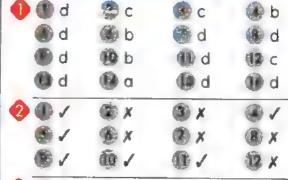
  Фенератор

  Фенер
  - a coal natural gas

Kinetic - electric

- - (2)
- To reduce the burning of fossil fuel and air pollution.
  - Because it converts the kinetic energy into electrical energy.
- It will produce thermal energy that heats water to turn it into steam.
  - It operates turbines to produce kinetic energy.
  - It turns into steam.
  - It will generate electricity.

## Lessons 4 & 6



- Global warming Acid rain
  - Carbon dioxide
    - Renewable resources
    - Nonrenewable resources
    - Smog
- renewable
  - temperature climateairwater- soil
- 5 b d a c 6 (2) (4) (3) (5)
  - (1)

P.O.V	Acid Rain	Global Warming
Reason of Formation	Carbon dioxide is produced from burning fossil fuel.	Carbon dioxide is produced from burning fossil fuel.
Disadvantages	1. Death of trees 2. Erosion of buildings	Increase the Earth's temperature and change the climate

- To reduce the burning of fossil fuel and pollution.

  8
  - Because fossil fuel can't be renewed easily.

- Because solar energy doesn't pollute the environment.
- Because they cause water and soil pollution.
- It will cause global warming
  - Fossil fuel will run out.
  - It will dissolve the buildings' rocks.
  - It will cause air, water, and soll pollution.

## Model Exam

#### Question 1

- (A) (b) d

- (B) Generator

#### Question 2

- (A) (B) X



## (B) Charcoal

#### Question (3)

- (A) (b)

- (B) Because it takes millions of years to be formed and can't be renewed easily.

## Model Exam / 2

#### Question 1

- (A) (D d
- 2 C

- (B) Nonrenewable energy resources

#### Question 2

- (A) (B) X

(B) Coal

#### Question (3)

- (A) (a) 2

- (B) These remains will be transformed into coal.

# Concept 3

## Lesson 🕦 🗓

- 20 C
- d d a 🦭
- 🐠 b О

- (iii) a 10 d
- B) b
- 12) C

- 2 /
- 3 X
- A X

- 10 X
- Renewable energy resources
  - Sun Concave mirrors
  - Wind turbines
  - Solar water heater
- M kinetic electric
  - kinetic electric
  - 3 water- wind
  - shorter
- less
- mirrors- sunraus
- Greenhouses
- Mind, water
- Oll, coal

Coal - oil

6

P.O.C	Old Windmills	Wind Turbines
Function	Grinding grain	Generating electricity
Number of Blades	More blades	Fewer blades
Height	Shorter	Taller

- (A) (b)
  - (B) (b)
- (2) C
  - (3) a
- **(1)**
- (1) (2)

(B) a

- way of working
- kinetic energy of wind

- a. A concave mirror
  - b. It collects and focuses sunrays on metallic pots to cook food.
  - 🔰 a. solar energy
    - b. thermal energy
    - c. the roof of houses
- 🔟 🐠 It will produce kinetic energy to grind grain and make flour.
  - It will not generate electricitu.
- Because it is natural resource that never runs out.
  - To grind grains to make flour.
  - To generate electricity.
  - To make their lives easier.
  - Because atmosphere, water, and the Earth's surface absorb the radiant energy of the Sun causing a rise in the Earth's temperature.
  - Because they help farmers plant the crops that only grow in a warm climate.

## Lesson 2

- (3) C
- of d
- (3) 1
- Wind turbine The Sun

6 C

- Generator
- 🚺 🌒 warms move - blow
  - (1) kinetic electric W wires
  - electric irrigation equipment

- \delta 🐌 It changes kinetic energy into electric energy.
  - 🖏 It generates more electricity, as its efficiency increases.
- Due to the difference in temperature between cold and hot air.
  - Because it converts the kinetic energy into electric energy.

## Lessons 🕄 & 4

- Generator
- Dam
- Hydroelectric energy
- kinetic
  - Wind turbines water turbines
  - 3 wires
  - evaporates condenses

#### P.O.C. Wind Turbines Water Turbines

Location	Windy areas	On rivers and waterfalls
	Both use renewable	
Similarities	energy resources.	
	Both change the kinetic	
	energu into electric energu	

- a. A b. potential kinetic
  - a. a dam b. potential
    - c. generator hydroelectricity
- The potential energy of the water will increase.
  - Its potential energy will change into kinetic energy.
- To control the flow of water and increase its potential energy.

.

#### (Model Exam Question 1 (A) (h b (B) Dam Question 2 (A) (A) X (B) Because atmosphere, water, and the Earth's surface absorb the radiant energy of the Sun causing a rise in the Earth's temperature. Question (3) 1) solar water energy 12 thermal energy 3 the roof of houses Model Exam Question 1 (A) (1) C (B) Solar heater Question @ (A) (B) X (2) J (B) Electricity won't be generated. Question ( D b (2) C (A) a School Book Assess Your Learning on Unit 3 a b 2 b 1 b **2 a** (2) (d) (3) b (4) **(1)** (5) Electric energy - light energy thermal energy Turbines - Generator Inputs: Kinetic **Outputs: Electrical**

#### Unit 4 Concept () Lesson 🕦 (3) b a d 2. b d (7) d 6 C (3) 2 X 6 1 (2) X 10 Canuons Water Changing Water very long weaker 5 ( steep quickly – very slowly Wind - water Coastal rocks- sandcastle (a) a 6 1 b (1) (1), (3) - (2)(2)

- Due to the effects of wind, water, and weather conditions.
  - Because some changes are fast and some are very slow.
  - Because it is washed away by sea waves.
  - Because water and wind may break off some parts of its rocks.
- The sandcastle will disappear after a while.
  - The sandcastle will be disappeared and the coastal rocks will be the same.

St.

#### Lesson 2 🖷

- 1 a b
- (2) b (a) b

10 b

14 c

C C

- C C (B) d
- d

(13) b

a a M d

- (3) X
- CO X

3 C

- 🚯 🕕 weathering
  - Roots
- red Oxygen
- Chemical weathering

10 /

- wider
- rocks
- plants roots
- Acids
- Acid rain
- Mechanical chemical
- oxygen iron
- 6 Erosion
- Weathering
- Deposition
- Mechanical weathering
- Chemical weathering
- Lichens
- Oxygen
- (a) Root
- Limestone cave
- 10 Iron

**(3)** 

- 6 1 c (2) d
- (3) b
- a

- **(2) (4)**
- (T)

- (M)
- (M) (C)
- (C)

- (C)
- (C)
- (M)
- (C)
- **2** (1) **(4) 3** (3)
- Because it helps you decide what to wear when you go outside.

- Because it may cause the breaking down of statues and the peeling of buildings' paint.
- Due to the weathering process.
- Because the oxugen reacts with iron in a toy car, forming rust.
- Because the oxygen reacts with iron in rocks, forming rust and breaking off rocks.
- Because they produce acids that dissolve minerals found in rocks.
- Because it causes the smoothing of rocks and breaks them down
- Because it breaks down the rocks. without changing their structure.
- It will rust.
  - It will smooth the rocks and break them.
  - The rocks will be weak and easy to break.
  - It will dissolve minerals in rocks. causing them to break off.
  - It will cause chemical weathering by dissolving minerals that recombine. forming new substances.
  - Acid will eat away rocks so they become weaker and break down easily.
  - The cracks become wider, so the rock breaks down.

#### Lesson 3

- - (2) b (8) d
- **3** b (2) C

- - 2 X
- (B) /
- chemical
- long
- mechanical
- mechanical

- Chemical mechanical
  - 2 matter
- breaks down
- long
- Chemical weathering
  - Mechanical weathering
- 🚯 🐠 Because the biscuit is broken into small pieces, but it is still same material.
  - Because it produces a completely different new substance "dough".
  - Because chemical weathering causes a completely new different matter.
- 7) The material will not change and mechanical weathering occurs.
  - The materials will change and chemical weathering will happen.

## Lessons 🚳 & 🗐

- - a d C C

10 /

- (3) a 源 b
- (B) a

X (B)

12 X

- (10) a
- (3) X Z X 41 /
- Erosion
- River
- Deposition

Gravity

- Delta
- 🐠 🕦 gentle wind hurricane **Egyptian Western Desert** 
  - Nile delta
- water
- deposition
- (2) b (3) a
- Weathering
- 2 Deposition
- Deposition
- **Erosion**
- Deposition
- Erosion

- Because it pulls broken rocks down mountainsides.
  - 2 Due to the deposition of sand carried by the wind.
  - 3) Because deposition occurs when eroded sediment stop moving.
- Rain washes the soil, causing erosion.
  - 2 Sand will be deposited, forming sand dunes.
  - 3 It will form a delta.

#### Question (1)

- (A) (A) C

- (B) It will form a red -rust layer on rocks.

#### Question (2)

- (A) ∰ ✓
  - (2) X

- (B) Because oxugen gas reacts with iron found in rocks.

#### Question (3)

- (A) Tocks
  - 2 Limestone caves
  - 3 weathering
- expands
- (B) Lichens

## Model Exam.

#### Question 1

- (A) (b)
- (2) d

(B) Erosion

#### Question (2)

- (A) (B) X
- (B) Digestion

#### Question (6)

- (A) ( d

- (B) It will dissolve minerals of the rocks so the rocks become weaker and break down easily.

# Compate 2

- ♠ ⊕ c⊕ c⊕ b⊕ d
- ON OX SX
- Canyon
   Wadi Nakhr canyon
  - Colored Canyon
- 4 Impression
  - brown and black colored
  - V-shaped
  - small canyon water stream
- 🚳 🐠 Gravity
- canyon million
  - Weathering erosion
- Because a stream of water may have formed it.
  - Because they have different rocks, texture, and color.
- It will leave impression and may form a small canyon.
  - The small canyon will get deeper.

#### Lesson 2

- 1) 1) a 2 b 3 b 4 c
  2 1) x 2 √ 3 x 4 √
- Weatheringdepositionmany years

- Because it helps us predict the future changes of landforms.
  - Because the river path may change and cause erosion and deposition of the house.
- 6 1. The house may get eroded.

#### Lesson 3

- 1 1 b 2 c 3 a 4 b 5 d 6 b 76 c 18 a
  - (R) d
- 2 1 x 2 √ 3 x 3 √ 5 √ 6 x 7 x 3 √
- 3 1 Gravity 2 Canyon
  - 3 The Grand Canyon
  - Rivers
- 4 1 gravity
  - (a) Increases more
  - 3 less sediments
  - 5 high many layers
- 5 1 x 2 / 3 / 1 /
- Because they are formed due to the erosion by rivers or streams.
  - 2) Due to the gravity.
- - The water speed increases causing more erosion.
  - The water of the river will cause more erosion.

## Lessons 4 & 6

- 3 d (2) d 1 0 d (2) C (3) d
  - ( a
- X 3 X 2 X O X (3) / (8) X (12) X
- Silts
- Delta

110 /

Mediterranean Sea

ID X

- Sand dune Wind erosion
- 🕢 🕦 canyon delta 🎱 fan
  - decreases deposition
  - increases
- 6 1 b (2) d C
- 🕜 🌓 delta deposition
  - area "C" area "B"
- (1) A

(2) B

(A) a

- 🔞 🐧 Because wetland plants slow down water and increase deposition rates.
  - Because river water speed decreases.
  - Because wetland plants are responsible for slowing down the water.
  - Because sand dunes are formed when a barrier like a rock blocks the wind.
- A delta is formed.
  - Sand grains will be deposited forming sand dunes.
  - Sand grains are blown from South to North direction.

#### Mouel Exam

#### Question ()

- (A) ( c
- (B) The canyon will get deeper and becomes a bigger canyon.

#### Question (2)

- (A) (A)
- (B) Because the river may change its path and erode the house.

#### Question (6)

- (A) (II) sand dune
  - delta sediments
  - (3) less
- (B) Canyon

#### Model Exam

#### Question 1

- (A) (B) b
- (B) Weathering and erosion

#### Question 2

- (A) (B) X
- (B) Gravitu

#### Question 🕄

- (A) (b)
- (3) d
- (B) The sediments will be deposited and form a delta.

#### School Look

#### Assess Your Learning on Unit 4

- 1 (1) d
  - a d
- b

- (S) b
- (8) b III a
- (III) c
- ② Erosion of water (Valley)
  - Deposits of water (Delta)
  - Erosion and deposition due to wind (Sand dune)

## Final Revision Model Answers

#### Unit 3

#### Concept 1

- ② ③ ✓ ② X ③ X ④ X ③ ✓ ③ X ⑦ ✓ ⑤ ✓ ③ X ◎ ✓ ① ✓ ② X ⑥ ✓ ④ ✓
- Mars Curiosity Rover
  - Chemical energy
  - The Sun
  - Thermal energy
  - Chemical energy
  - Energy chain
  - Electric lamp
  - Thermal energy
  - Minetic energy
  - Sound energy
  - Thermal energy
  - Thermal energy
  - Copper
  - (1) Thermal energy
- heat
  - sound kinetic
  - Coal
  - electrical output
  - electrical

- 6 Lamp
  - Light bulb
- (A) (D) a (2) C b (B) (B) d 4 b (C) (D) d (2) C (D) (C) (2) d (a) b (A) C Kinetic 2. (1) (1) - (3)(3) (2)
- (A) Chemical kinetic thermal
  - (B) Electrical light thermal
- Because the robot is very far from any store or any plug.
  - Because when the wood of the trees is burned, chemical energy stored in wood is changed into thermal energy.
  - Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.
  - Because electrical energy changes into light and heat energies.
  - Because sound energy doesn't help the blender do its main function.
  - Because thermal energy helps the electric heater do its main function.

- (i) (ii) Kinetic energy changes to thermal energy.
  - 2 Electrical energy changes into light and thermal energies.
  - 3 Electrical energy changes into kinetic energy.
  - Some of the produced energy is lost in the form of heat.

## Concept@

- (S) d (2) C a 🕦 🕼 d (6 d (B) a The CI 5 b (12) C 11 a 9 C 10 d 16 d 14 C 15 C 13 C 17 b 119 d 18 a 2 / 3 1 K W (B) / F X 5 X 12 1 400 / 91 (TO X 16 X 13 X 14 / 15 X 17 X
  - 1 Gasoline pointer
    - 2 Gasoline
    - 3 Chemical energy
    - Thermal energy
    - 5 Fuel
    - Nonrenewable resource
    - 7 Renewable resource
    - 8 Biofuel
- Fossil fuel
- 10: Oil (Natural gas)
- 11 Coal
- 12 Charcoal
- 13 Liquid fuel

- Electrical energy 15 Turbine
- **Generator**
- Global warming 18 Acid rain
- 19 Carbon dioxide
- 👍 🐧 wood coal
  - temperature pressure
  - renewable nonrenewable
  - steam generators
  - kinetic electrical
  - renewable 7 air
  - 8 water soil
- 6 wood
  - 2) oil underground
  - 3 deforestation
- (A) (B) b (2) c (3) d (B) a
  - (B) (B) c (2 a (3.) b
  - (C) 16 b 12 c 3 d 4 a (C) a (D) 16 b 12 d 3 a 4 c c
  - Oll (2) Coal
    - (3) Charcoal
- To help the driver check the amount of gasoline (fuel) left in the car's fuel tank.
  - Because it starts to run out as we use it and can't be renewed easily.
  - Because it is renewed with the continuous growth of plants.
  - Because generators convert kinetic energy into electrical energy.

- Because it takes millions of years to be formed and starts to run out as we use it and can't be renewed easily.
- To reduce the burning of fossil fuels in normal vehicles and reduce air pollution.
- Chemical energy changes into thermal energy.
  - It leads to deforestation.
  - It produces thermal energy that changes the water into steam.
  - It turns into steam.
  - It may cause the decomposition of some rocks, including bricks of buildings.

#### Concept 3

- an a (#) b (8) C 10 b (III) b ( d **9** d 2 / 3 X A X 6 1 優大 BX 12 / 10 X (M) X BA X 13 / 15 X
- Renewable energy resources
  - Concave mirrors
  - Wind turbine
  - Solar heater
  - Generator
  - Dam
  - Hydroelectric energy

- Maria electrical
  - kinetic electrical
  - less
  - mirrors sunrays
  - Greenhouses
  - move blow
  - wires
- **b** ② C (3) a
- **6 (1)** 
  - **(1)** (2)
  - 3) their ways of working
  - the kinetic energy of the wind to be operated.
- (a) 3
- To grind grains to make flour.
  - To generate the electricity needed to light houses and operate different devices.
  - Because the atmosphere, water and soil absorb heat energy from the Sun.
  - lacksquare Because they help farmers in lacksquareplanting crops that need warm weather.
  - Because it changes the kinetic energy to electrical energy.
  - To control the flow of water and increase the gravitational potential energy of water to generate electricitu.

- The wind turbines will not move, so they can't generate electricity.
  - 2 They will rotate faster and produce more electrical energy.
  - The gravitational energy of water changes into kinetic energy to rotate the water turbines and generate electricity.

#### Unit 4

## Concept 1

- a d (3) b ( C (A) d (F) a B b (12) b 10 b (M) d .13 d (4) a (15) C A C 3 / 4 X (2) X (2) X (B) X (8) X (12) X (M) / 10 / 15 X 13 / (B) /
- Canyons
  - 2 Erosion process
  - 3 Deposition process
  - Chemical weathering
  - 5 Lichens
  - Oxygen gas
  - 7 Chemical weathering
  - Mechanical weathering
  - **9** Gravity
  - 10 River's water
  - 11 Deposition process
  - 12 Delta

- (A) 
   plant roots
  - Acids
  - Acid rain
  - Mechanical chemical
  - oxygen iron
  - (B) (B) gentle wind hurricane Egyptian Western Desert
    - Nile Delta
    - water
    - deposition
- (3) (1) (2) (1) (1) (3)
- Because of many factors, such as wind, water and weather.
  - Because oxygen gas can react with the iron in the rocks forming red-colored rust, which makes the rock weaker and break down easily.
  - Because they produce acids on rocks that makes the rock weaker and breaks down easily.
  - Because chemical weathering changes the rocks structure and forms a new matter, while mechanical weathering doesn't change the rocks structure.
  - Because eroded rocks must be deposited after some time.
- The rocks become weaker and break down easily.
  - Acid rain will dissolve the minerals in rocks, so they become weaker and can be broken off more easily.

\*

- The acids cause the breaking down of rocks.
- The cracks become wider, so the rocks break down easily.

#### Concept @

(2) C 10 (11) C (3) a a a **B** d 6 C √ b 9 C 10 a (II) d (12) d (13) d 14 C (15) b 16 a 2 1 X 2 X 3 / 41 5 X 6 X (Z) X BJ

00) X

15 /

13 x 12 x

Canyon

- Gravity
- 3 The Grand Canyon

10 X

- A Rivers (Streams)
- S Silt
- 6 Delta
- Erosion
- (A) (I) impression
  - brown and black-colored
  - 3 V-shaped
  - a small canyon water stream
  - (B) 1 gravity
    - 2 Increases more
    - 3 less
    - sediments
    - 6 high layers

- (C) 1 canyon delta
  - 2 fan
  - 3 decreases deposition
  - increases
- (A) (1) a 2 b (3) c
  - (B) 1) b 2 d 3 c 4 a
- **6** Gravity

12 X

16 X

- **♦** 10 x 2 √ 3 √ 4 √
- (B) (I) delta deposition
  - area "C"
    3 area "B"
- ② 1 A 2 B
- Because the river may change its path and cause erosion and deposition of the house.
  - Because they are formed due to erosion by rivers or streams.
  - Due to the erosion and deposition of the wind-blown sand.
- 🕕 🕦 It may form a small canyon.
  - This small canyon becomes deeper.
  - They will form a river causing more erosion.
  - Sediments will be deposited forming a delta.
  - Sand is deposited forming a sand dune.

## **Government Model Exams Answers**

#### 🚛 📗 Cairo Governorate – Exam 1 🦨

#### Question 1

- (A) (I) d
- (2) b

- (B) A small canyon may be formed.

#### Question @

- (A) (II) /

- (B) Due to the reaction with oxygen causing chemical weathering.

#### Question (3)

- (A) 1 thermal
- 2 warm
- (3) chemical
- gravity
- (B) Solar energy

#### 2 Cairo Governorate - Exam 2

#### Question 1

- (A) (I) a
- (2) C
- (B) The sediments will be deposited forming a delta.

#### Question (2)

- (A) (B) X (2) X

- (B) Because they mix with the water in the canals causing water and soil pollution.

#### Question (3)

- (A) sand dune
- weathering
- natural gas
- valley
- (B) Natural gas

#### 🖊 3 Cairo Governorate - Zeitoun Żone 4

#### Question 1

- (A) (b) b
- 2 a

- (B) Chemical weathering Mechanical weathering

#### Question @

- (A) (B) X

- (B) Wind, water, and the gravity

#### Question (3)

- (A) (II) Canyon
- Possil fuel
- Law of Conservation of Energy
- Dams
- (B) Delta

#### 4 Cairo Governorate - Al-Azhar Al-Sharif

#### Question 1

- (1) C
- (2) b
- 30 b

#### Question (2)

- m b
- (2) d
- (3) C

#### Question (

- 10/2/

#### Question (4)

- 1 Biofuel
- 2 Kinetic energy
- 3 Weathering

#### Question 6

- 1 wood
- 2 Water
- 3 electrical

#### 11 Alexandria Governorate – Exam 3 4 / 13

#### Question 1

(A) (D C

(2) a

3 c

a b

(B) To conserve electricity.

#### Question 2

(A) 1 Digestion

2 Glass

Acid rain

Fossil fuel

(B) Acids will eat away rocks so they become weaker and are broken down easilu.

#### Question (3)

(A) (I) /

x 3

x .

(B) Fuel

#### 12 Dakahlia Governorate

#### Question 1

(A) (1) chemical

Natural gas

3 Canyons

Deposition

(B) It will dissolve the minerals in the rocks, so the rocks become weaker and break down easily.

#### Question 2

(A) (D /

2 X

3 1

AX

(B) Friction occurs between sand grains carried by wind and rock. This causes smoothing of rocks and breaking them down.

#### Question (3)

(A) 1- 1 Law of Conservation of Energy

Oxygen gas

2- 1 Electrical energy – Thermal energy

Chemical energy – Kinetic energy

(B) To control the water flow and increase its potential energy.

#### 13 Suez Governorate

#### Question 1

(A) 1 b

2 d

(3) d

(4) a

(B) Because it reacts with the oxygen of the air.

#### Question 2

(A) ① /

2 X

3 7

4

(B) Charcoal

#### Question (3)

(A) 1 gently

2 Oil

renewable

deposition

(B) A delta will be formed.

#### 14 Port Said Governorate

#### Question 1

(A) 1 d

(2) a

3 0

a

(B) Weathering

#### Question @

(A) (B X

2

3

(A) 1

(B) Because Iron reacts with oxygen.

#### Question (3)

(A) Mars

2 renewable

3 rocks

Increases

(B) A canyon will be formed.

#### 15 Behira Governorate

#### Question 1

(A) ( C

3

2 b

3 0

b

(B) Law of Conservation of Energy

#### Question 2

(A) ① X

2 1

3 /

41

(B) Irritation of eyes and lungs – Damage of lungs – Heart diseases

#### Question (3)

(A) (1) C

2

(3)

(4) b

(B) Generator

#### 🚀 🎝 🕽 Giza Governorate – Exam 1 🌽

#### Question 1

- (A) (1) C
  - (2) a
- 4 a

(B) oxygen

#### Question (2)

- (A) 1 / 2 /

- (B) Sediments will be deposited forming a delta.

#### Question (3)

- (A) Water
- 2 biofuel
- 3 Sun
- **a** sound
- (B) Acid rain

#### 6 Giza Governorate – Exam 2

#### Question 1

- (A) (iii) X

- (B) the erosion and deposition of the wind-blown sand

#### Question (2)

- (A) (b)

- 4 C

(B) delta

#### Question (6)

- (A) (B) C
- (2) a
- (3) d
- (B) weaker and break down easily.

#### 🖊 🚺 Giza Governorate – Exam 3 🗸

#### Question 1

- 1 Chemical energy
- Global warming
- 3 Electrical energy
- Sand dunes
  Substituting

#### Question (2)

- (II) X

5 X

#### Question (6)

- (A) ( C
- (2) a
- (B) Solar water heater
  - solar thermal

#### Qalyubiyya Governorate

#### Question

- (A) (D d

- (B) Photosunthesis

#### Question (2)

- (A) 1 / 2 X

- (B) Chemical weathering

#### Question (3)

- (A) (II) d (2) c
- (3) b
- (B) Oil Nautural gas

#### 🚀 Alexandria Governorate – Exam 1 🐇

#### Question 1

- (A) (b) (2) d
- (3) d
- (B) As they grow inside rock cracks, the cracks become wider, causing breaking down of rocks.

#### Question 2

- (A) 1 thermal
- smog
- 3 mechanical
- erosion
- (B) It will cause chemical weathering.

#### Question (8)

- (A) 1 / 2 X
- (B) Fossil fuel

#### 10 Alexandria Governorate – Exam 2 4

#### Question 1

- (A) (1) charcoal
- 2 Sun
- a electric lamp
- Copper

(B) /

#### Question 2

- (A) (1) a
- 3 b

(B) Sound energy

#### Question (3)

- (A) (I) C
- 2 d

- (B) Because it reacts with oxygen.